DOCUMENT RESUME

ED 439 694 IR 019 968

AUTHOR Matz, C. Michele
TITLE Administration of Web versus Paper Surveys: Mode Effects and Response Rates.
PUB DATE 1999-11-00
NOTE 87p.; Masters Research Paper, University of North Carolina at Chapel Hill.
PUB TYPE Dissertations/Theses (040) -- Tests/Questionnaires (160)
EDRS PRICE MF01/PC04 Plus Postage.
DESCRIPTORS *Academic Libraries; Data Collection; Electronic Mail; Higher Education; *Library Surveys; Nonprint Media; Printed Materials; *Response Rates (Questionnaires); *Surveys; *World Wide Web

ABSTRACT

A survey of academic reference librarians in North Carolina provided data for an examination of differences in survey administration on paper and the World Wide Web. Research via the Internet is becoming more attractive for many researchers, but the effects of this medium upon research outcomes have been little explored. This study examined in particular sampling and mode effects, and response rates of Web surveys. The study found no sampling bias or mode effects in tests of the respondents' demographics and the content of responses. Response rates to Web surveys are not as high as traditional survey methods, and while responses are gathered more quickly, the paper instrument was not far behind. E-mail notices were more efficient for promoting the Web survey than paper notices. Traditional postal surveys still hold some advantages over Web surveys. Researchers must weigh the advantages in cost and speed to justify use of such instruments. Appendices contain paper survey, Web survey, sample cover letters, selected statistical test results, and survey content summary. (Contains 30 references.) (Author)

Reproductions supplied by EDRS are the best that can be made
from the original document.

SCOPE OF INTEREST NOTICE
The ERIC Facility has assigned this document for processing to: IR
In our judgment, this document is also of interest to the Clearinghouses noted to the right. Indexing should reflect their special points of view. TM

ED 439 694

Administration of Web Versus Paper Surveys: Mode Effects and Response Rates

by
C. Michele Matz

A Master's paper submitted to the faculty
of the School of Information and Library Science
of the University of North Carolina at Chapel Hill
in partial fulfillment of the requirements
for the degree of Master of Science in
Library Science.

Chapel Hill, North Carolina

November, 1999

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL HAS BEEN GRANTED BY

M. Matz

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

- This document has been reproduced as received from the person or organization originating it.
- Minor changes have been made to improve reproduction quality.
- Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

IR 019968

BEST COPY AVAILABLE

C. Michele Matz. Administration of Web Versus Paper Surveys: Mode Effects and Response Rates. A Master's paper for the M.S. in L.S. degree. November, 1999. 86 pages. Advisor: Barbara M. Wildemuth.

A survey of academic reference librarians in North Carolina provided data for an examination of differences in survey administration on paper and the World Wide Web. Research via the Internet is becoming more attractive for many researchers, but the effects of this medium upon research outcomes has been little explored. This study examined in particular sampling and mode effects, and response rates of Web surveys. The study found no sampling bias or mode effects in tests of the respondents' demographics and the content of responses. Response rates to Web surveys are not as high as traditional survey methods, and while responses are gathered more quickly, the paper instrument was not far behind. Email notices were more efficient for promoting the Web survey than paper notices. Traditional postal surveys still hold some advantages over Web surveys. Researchers must weigh the advantages in cost and speed to justify use of such instruments.

Headings:

Surveys—methodology

Surveys—evaluation

Surveys—Internet

College and university libraries

Surveys—reference services

Library schools - Theses - University of North Carolina at Chapel Hill

Table of Contents

I. Introduction 4

II. Literature Review 5
Sampling Effects 6
Mode Effects 7
Advantages of Electronic Surveys 11
Publicizing Electronic Surveys 15
Summary of Research Questions 16

III. Methodology 17
Population 18
The Survey 19
Procedures for Distributing the Surveys 20

IV. Results 22
Hypotheses 1 23
Hypotheses 2 and 3 23
Hypothesis 4 25
Hypothesis 5 25
Hypothesis 6 27

V. Discussion 28
Technical Difficulties 30

VI. Conclusion 31

Bibliography 33

Appendix A – Paper Survey A-1
Appendix B – Web Survey B-1
Appendix C – Cover Letters C-1
Appendix D – Selected Statistical Test Results D-1
Tests for Hypothesis 1 ..... D-1
Tests for Hypotheses 2 and 3 ..... D-5
Tests for Hypothesis 5 ..... D-13
Other Comparisons D-14
Appendix E – Survey Content Summary E-1

I. Introduction to the problem

Social science researchers have noted that the medium in which a researcher gathers data may affect the data gathered (Babbie, 1998). This effect may skew what audience is reached, the kinds of information gathered or whether the audience self-selects in a particular way. A number of studies have examined the benefits and liabilities of various data collection methods including personal interviews, telephone interviews, mail surveys, and electronic mail surveys; however, few studies have examined surveys administered on the World Wide Web. While a growing number of surveys are being posted on Web sites and there is much speculation as to how this new medium will affect the results, little outcome data is available.

Whereas surveys have been administered electronically—that is, on computers—since the late 1960s, these were usually surveys that were given to traditional population samples. Participants were invited to go to a particular place where they would sit at a dumb terminal and answer the survey questions as they were prompted by the screen. A researcher might or might not be present to clarify questions. Electronic mail offered a way to send the survey to the respondent to answer at his or her convenience. A number of the earlier studies of email surveys were conducted within a particular organization: a university or a company. Very quickly, though, researchers began to see the potential of reaching a much broader audience via such avenues as listservs. Here was a way to negate geographic boundaries and reach very large numbers of people. Web surveys

seem to offer many of the same benefits as email surveys, but with a much nicer graphic interface, and electronic forms (with form "objects") that provide the means for a researcher to standardize the responses. (For example, radio buttons will only permit one answer, while check boxes allow multiple responses.)

Many studies have established the skew in demographics of Internet users (e.g., the GVU survey [GVU Center, 1998]). The current study sought to examine directly this sampling effect. Specifically, it controlled for sampling bias by surveying a population that, while Internet-savvy, is not circumscribed by participation in the Internet. In addition, the responses received via a Web survey were compared with those received via a traditional paper survey. Finally, two variations in promoting the Web survey were compared: a letter mailed in the usual way and an email letter.

Although Web surveys are only beginning to be examined in the literature, studies of electronic mail surveys have demonstrated some administrative benefits that should be equally applicable for Web surveys. Email surveys have been shown to be particularly advantageous in terms of cost and speed. Further questions for the study involved how quickly surveys were returned, and the comparative response rates elicited by the Web and paper instruments.

II. Literature review

Sample effects of Internet populations and mode effects of electronic surveys are major factors for researchers to consider when conducting a survey with an Internet population. It is important to understand the implications of such effects in order to avoid their consequences, as this study attempts to do. In particular, the sampling effects and mode effects that occurred with the use of electronic mail surveys will be discussed, as

well as the ways in which such effects had an impact on study results. In spite of the disadvantages associated with sampling and mode effects, there are distinct advantages to administering surveys electronically, both by email and over the Web. These advantages will be described along with other characteristics of the two types of surveys. Implications for the current study will be considered.

Sampling Effects

A major factor affecting Web surveys is the overall population that uses the Internet has different characteristics than the general population. A recent survey of Internet users found 67.5% of their respondents were men (Pitkow, 1996). Other groups over-represented among Internet users are whites, the young, the rich, and the highly educated (GVU Center, 1998; Anderson and Gansneder, 1995). If the sampling frame from which a researcher selects a study population is unrepresentative of the general population, that study will exhibit the skew of the sample. Because Internet users do not constitute a representative sample of the population, researchers have been wary of the potential for a strong sampling bias (Shaw and Davis, 1996; Walsh, Kiesler, Sproull and Hesse, 1992). This continues to be true, although some of these same studies demonstrate the speed with which Internet use is becoming mainstream (Pitkow, 1996; GVU Center, 1998).

The skew in the demographics of the Internet population versus the general public clearly impacts what kind of research can be conducted via the Web, and the kinds of generalizations one can make from data collected in this manner. And although more research is being conducted with groups that are clearly Internet-literate, further questions must be asked, such as whether members of such a group have equal access to the

Internet and use it in comparable ways and at comparable levels. When the answer to any of these questions is no, predicting how survey responses will consequently be distorted becomes very difficult.

Mode Effects

One of the earliest surveys of electronic research identified significant mode effects—differences in results caused by the medium in which the survey was administered. Kiesler and Sproull (1986) queried students and faculty of a major academic institution who were known to have used email recently. They found important differences between the responses to their email versus print surveys.

Electronic respondents were more cooperative, returning a larger number of surveys in a shorter period of time than paper respondents. Electronic respondents made fewer errors in responding to questions and refused to answer or skipped fewer questions than paper respondents. And finally, the electronic responses were more "extreme," or further from a socially accepted norm. They theorized that the lack of social context in the electronic medium, normally provided by such cues as a cover letter's institutional letterhead, resulted in respondents feeling less inhibited to respond freely.

Kiesler and Sproull's results were further strengthened when they re-administered the survey four months after the initial instrument to volunteers from the original group of respondents. They switched the medium in which the subjects received the survey to the one each group had not used in the first round. Although the number of responses was smaller, the anticipated effects were the same. They concluded that, although there was "considerable similarity of response between the paper and electronic survey", it was

"not so much that the two may be considered interchangeable without further research." (411)

Despite some disagreement in the literature, however, most other studies have not found significant mode effects in responses gathered electronically. Erdman, Klein and Greist (1983) found little difference between computer-administered and paper survey reports of drug use/abuse. Skinner and Allen (1983) found no significant difference between self-reported levels of alcohol, drug and tobacco use reported in face-to-face interviews versus those reported via computerized questionnaires. And in direct conflict with Kiesler and Sproull's results, the computer responses in their study indicated slightly lower reported frequencies of alcohol and marijuana use.

Helgeson and Ursic (1989) evaluated decision process equivalency of undergraduate business students via electronic and paper data collection in part by comparing how the substance of answers changed when the order of survey questions was changed. They found no significant differences between the content of responses gathered electronically versus on paper; however, they found respondents' decision processes to be more stable in the electronic medium. As the extremity of scale anchors changed, answers in the electronic medium remained more stable than those on paper. Booth-Kewley, Edwards and Rosenfeld (1992) surveyed male Navy recruits with Paulhus's Balanced Inventory of Desirable Responding (1984), varying the medium in which they responded (electronic and paper) and the level of anonymity of the respondents. While they found a significant variance of response in relation to the level of anonymity, the effects of the survey medium were insignificant.

Synodinos, Papacostas and Okimoto (1994) administered a survey to randomly- and self-selected airport users via computer terminal and to randomly-selected users via personal interview. They found no significance differences in the responses between computer respondents and those personally interviewed, but, predictably, did find significant differences between self-selected and randomly-selected respondents. In their survey about Usenet newsgroup users' attitudes toward Internet commercialization, Mehta and Sivadas (1995) found no difference between their email and regular mail responses.

Bachmann, Elfrink and Vazzana (1996) surveyed business school deans and division chairpersons and found no significant difference between responses to the email and regular mail instrument. Bertot and McClure (1997) surveyed public libraries across the country via the Web about Internet use, and at the time of publication had found no response-rate bias on the basis of the population size of responding libraries' legal service area or region (their study was ongoing). They did receive a greater response from some geographic regions--34.8% from the Midwest and 28.2% from the West compared to 19.6% from the Northeast and 17.4% from the South--but "it is unclear as to whether the percentages of electronic survey respondents by region and population of legal service area correspond to public library Internet connectivity in general by those strata." (174)

A few studies did find differences between responses from electronic and paper instruments, but felt they were the result of other factors than the survey mode or that they were within acceptable limits. Miller, Daly, Wood, Brooks and Roper (1996) found a difference in response content between their email and paper surveys of professional computer scientists, but they attributed it to the two versions of the survey reaching

different audiences defined by job position and concluded that little self-selection bias (which can be interpreted as sampling frame bias) was evident in their study. Morphew and Williams (1998) determined email surveys to have a "sizable risk of nonresponse bias due to low response rates" but that the risk "is on the order of that associated with postal surveys." (p. 52)

A few studies did note apparent mode effects but they may actually have been sampling frame effects, specifically differences in demographics and computer experience. Shaw and Davis (1996) reported significant differences in responses between their electronic and paper groups in a survey of Modern Language Association members, but these corresponded to demographic differences between the respondents in the two groups, especially that electronic respondents were much more experienced with electronic technology. These participants were more likely to have a computer at home, more likely to use email, and more likely to use online library catalogs. Similarly, Anderson and Gansneder (1995) noted that comparisons of computer-monitored data between respondents and non-respondents indicated the former were more likely to use the computer and for longer periods of time. Their survey collected mainly demographic and electronic experience data, so substantive differences could not be measured. Finally, Kaufman, Carlozzi, Boswell, Barnes, Wheeler-Scruggs and Levy (1997) found in their survey of gays, bisexuals and lesbians about therapist selection that respondents to their electronic survey were more open about their sexual orientation than respondents to the paper instrument. The authors attributed the difference to the demographic differences between the two groups: "The email sample was younger, more educated and had higher reported incomes than the traditional sample...." (295-6) These demographic

differences correspond to the general demographics of Internet users, although the paper and electronic groups in this study were both balanced between men and women. In the other studies, the selection parameters for the samples were also questionable: the assumptions made by the researchers may have involved faulty logic. Shaw and Davis selected members of a professional organization as being electronically savvy because the organization they supported chose to support the development of an important electronic bibliographic database, Modern Languages Association International Bibliography. Likewise, both Anderson and Gansneder (1995) and Kaufman et al. (1997) recruited participants for their electronic instruments from listservs, assuming a uniformity of sample that may not have actually existed.

The population of interest to the current study was academic librarians in North Carolina and was not chosen from a group organized on the basis of Internet participation. Thus, the first three hypotheses for this study were:

- Hypothesis 1: Respondents to the Web survey will not exhibit significantly different demographics from respondents to the paper survey.
- Hypothesis 2: Respondents to the Web survey will give responses that are not significantly different from responses to the paper survey.
- Hypothesis 3: Respondents will not provide significantly different answers to the Web survey whether they were notified of it by email or postal mail.

Advantages of Electronic Surveys

Electronic data gathering has significant advantages which are agreed upon in the literature. (Most of the studies cited here used electronic mail to distribute their surveys.) First, studies using electronic surveys note the low cost of administering them (Roselle and Neufeld, 1998; Berge and Collins, 1996; Clayton, Applebee and Pascoe, 1996; Miller

et al., 1996; Anderson and Gansneder, 1995; Kiesler and Sproull, 1986; Erdman et al, 1983). Few state their actual costs, but electronic surveys inevitably eliminate the need to copy surveys, as well as the cost of postage, usually the major expense in postal surveys.

Second, response is very fast. Several studies received the majority of their responses within one to two weeks of posting surveys (Roselle and Neufeld, 1998; Meehan and Burns, 1997; Berge and Collins,1996; Miller et al., 1996; Anderson and Gansneder, 1995; Mehta and Sivadas, 1995). Berge and Collins (1996) received their first response within twenty minutes of releasing their survey. Meehan and Burns (1997) received 39% of their responses within twenty-four hours. Mehta and Sivadas (1995) received more than half of all their responses within two to three days. Swoboda, Mühlberger, Weitkunat and Schneeweib (1997) received 90% of their 1,713 responses within 4 days. Morphew and Williams (1998) argue that multiple follow-up mailings make electronic survey periods comparable to mail and telephone survey periods, but they seem to be the only objectors.

Good response rates are less uniformly agreed upon as a benefit of electronic surveys. Several email surveys have received response rates fully on par with traditional instruments. Roselle and Neufeld (1998) studied the effectiveness of email followup messages for a traditional postal survey. They received responses from 85.3% of the participants who received the email followup, compared to a 79.8% response rate from participants who received a postcard followup. Their overall response rate was 83%. Anderson and Gansneder (1995) achieved a 68% response rate to their email survey, excluding from their calculation a number of people who, according to computer data, did not read their email during the survey period. (Their response rate including those

people was 58%.) Walsh et al. (1992) received a 76% response rate to their email survey of 300 oceanographers. In addition, they received responses from an additional 104 individuals spontaneously asking to participate. (The researchers analyzed this self-selected group separately from their original stratified random sample.)

Other studies note lower response to email surveys than paper instruments used for the same surveys, but only slightly lower, as demonstrated by Table 1.

Table 1. Comparison of Response Rates by Survey Medium

Study	Paper Response Rate (Percentage)	Electronic Response Rate (Percentage)
Bachmann et al. (1996)	66	53
Shaw and Davis (1996)	41	37
Kiesler and Sproull (1986)	75	67
Sproull (1986)	87	73
Miller et al. (1996)	30	*19

*See paragraph below

Only one survey reported an electronic response rate that was small enough as to be almost unusable. Miller et al. (1996) experienced significantly different response rates to their electronic versus their postal mail survey. The postal mail survey returned a 30% response rate. Although they could not conclusively state the size of the audience the electronic survey reached because they distributed the survey to a newsgroup, the authors based their estimated response rate on the average monthly postings per week of the newsgroup. Even using this very rough estimate of the number of recipients of the survey, the response rate for the email survey is 19%--and it could possibly be even lower than that if the number of recipients was underestimated.

Three other studies reported low response to their electronic surveys, but had not conducted more traditional surveys with which to compare them. Meehan and Burns (1997) reported electronic returns of approximately 23.6% from a survey of secondary school teachers and administrators. Smith (1997) reported a virtually unusable response rate to her electronic survey, but attributed this to technical difficulties respondents encountered with her instrument--some browser programs were unable to properly process respondents' completed surveys. Swoboda et al. (1997) received a 20% response rate to their survey about problems facing the world (political, social, etc.). It could be argued that in this case the low response is partially due to the target audience not being highly invested in the results of the questionnaire. Their survey was sent to 200 randomly selected newsgroups focused on a variety of subjects, so the individuals it reached were not as concerned about participating as if they had been, say, international affairs analysts or environmentalists.

The audience targeted by the current study is impacted daily in their professional work by the program which is the subject of the survey. Consequently, one would expect to have a high response rate regardless of the survey medium. The overall advantages reported for e-mailed surveys should also be present for a Web survey, so the next two hypotheses of the study were:

- Hypothesis 4: The response rate of a Web-based survey will be no different from that of a paper survey.
- Hypothesis 5: At least 50 percent of the total number of responses to the Web survey will be returned in one week.

Publicizing Electronic Surveys

Researchers are often interested in special populations for their research, and seek efficient ways to contact large numbers of a particular group rapidly. Listservs and electronic bulletin boards represent "large populations [which] are well-defined in terms of a particular phenomenon." (113, Miller et al., 1996) As demonstrated in the previous section, studies are beginning to demonstrate the efficiency of electronic media for reaching particular audiences, especially ones that are geographically diverse. The main difference for surveys posted on the Internet from those distributed by electronic mail is targeting.

Web surveys must be publicized. No audience will automatically see it without some promotional effort on the part of the researcher. Listservs and links on organization Web pages can be effective ways to advertise a survey; however, both strategies share the sampling bias of the Internet as noted earlier. In addition, they may be more or less effective depending on many factors such as user traffic, subject of the survey, and so forth. And these methods are not at all precise in targeting. A researcher cannot be completely sure of what population(s) they actually reach in these ways. Finally, they also make it impossible to calculate precise response rates. Membership figures for a listserv vary widely over any given period of time as individuals choose to withdraw from or join the list. Web page traffic may fluctuate widely depending on how often an organization's members seek updates or information. Also, an email sent to one listserv may be reposted to other groups. In both cases, the researcher cannot know the overall number of individuals who saw the advertisement, but only the number of people who respond (Berge and Collins, 1996; Miller et al., 1996; Walsh et al., 1992).

A way to circumvent this problem with en mass advertising is to use targeted email (Anderson and Gansneder, 1995; Shaw and Davis, 1995; Kiesler and Sproull, 1986). Using personal email addresses is usually as specific as postal mailing. Many professional directories now include members' personal email addresses. Researchers can randomly choose participants from the directory in the same way that they might select a sample of mailing addresses for a mail survey. It is advisable to type each individual's address into a separate message to avoid compromising other participants' privacy, rather than send one message to all participants. Functions such as "copy" and "paste" make this process fairly rapid. Anderson and Gansneder (1995) also note that addressing emails individually personalizes the appeal for response.

Apart from the time involved, one would expect this method of advertising to be highly efficient and have the added benefit of enabling the researcher to calculate an exact response rate. Mailed notices are a more traditional means of providing preliminary notice of a survey, but respondents may be discouraged from responding by needing to take the extra step of going to the Web to answer the survey. The final hypothesis was:

- Hypothesis 6: Of the two methods of publicizing a Web survey, postal mail and email, email is the more efficient one. More responses will arrive more quickly from the group notified by email.

Summary of Research Questions

Due to the skew of user demographics, Internet populations are likely to provide a poor sample for research surveys. However, the sole fact of administering a survey via the World Wide Web does not necessarily introduce such bias. Electronic surveys, whether distributed by email or the Web, are distinctly faster and less costly than

traditional postal surveys, but must be carefully publicized to produce response rates equivalent to more traditional methods. These observations have resulted in the following hypotheses for the current study:

- Hypothesis 1: Respondents to the Web survey will not exhibit significantly different demographics from respondents to the paper survey.
- Hypothesis 2: Respondents to the Web survey will give responses that are not significantly different from responses to the paper survey.
- Hypothesis 3: Respondents will not provide significantly different answers to the Web survey whether they were notified of it by email or postal mail.
- Hypothesis 4: The response rate of a Web-based survey will be no different from that of a paper survey.
- Hypothesis 5: At least 50 percent of the total number of responses to the Websed survey will be returned in one week.
- Hypothesis 6: Of the two methods of publicizing a Web survey, postal mail and email, email is the more efficient one. More responses will arrive more quickly from the group notified by email.

III. Methodology

Academic librarians in North Carolina were surveyed about their attitudes toward NC LIVE, a state-wide digital library initiative. After selecting a stratified random sample of academic reference librarians in North Carolina for this study, the sample was divided into three groups: two to receive notice of the electronic survey, one to receive the paper survey. A software program was chosen to process the Web survey responses and forward the results by email to the researcher. Once the survey was administered, returned surveys were tracked for date of receipt. Data entry was completed in SPSS 9.0. One-way analysis of variance and chi-square tests were utilized to analyze differences between survey groups. Bonferroni post-hoc analyses were used to further analyze

statistically significant ANOVAs. Spearman correlations were used to test relationships among ordinal data, and Pearson correlations were used to test relationships among interval data.

Population

The population for this study was academic reference librarians in North Carolina. A stratified random sample of 400 academic librarians was drawn from a combination of sources. The membership lists of the academic library sections of the North Carolina Library Association and the American Library Association provided 275 individuals for the survey, and another 125 were researched from institutions' Web page staff directories. The stratification method seems unlikely to have produced significant bias since email addresses were relatively easy to locate for all three strata in the sample. Difficulty seemed to arise with specific institutions rather than any given classification of institution (e.g., community college versus university). Representatives were included from across the state in all types of academic libraries, from large university libraries to community colleges and private colleges. Large numbers of individuals from the larger staffs in university libraries were offset by the greater number of community and small colleges.[1]

The total group of 400 was randomly divided into four groups: one received the paper survey, one received the paper announcement of the Web survey and a third received the email announcement of the Web survey. The fourth group was randomly divided into three further groups to provide substitutions for the first three groups. Such substitutions occurred when an individual's title made it clear he or she was unlikely to

1 The exact numbers of representatives from universities, community colleges, etc., were not calculated because those affiliations were not always apparent from the associations' mailing lists.

work on the reference desk, or if their mailing address or email address was incomplete, erroneous or unavailable. Overall, 37 substitutions occurred, 22 of them in the group receiving the paper survey and most often because of inappropriate position title.

For the group receiving the email notice, it was necessary to research individuals' work email addresses because no listserv exclusively serves academic librarians in North Carolina, and the membership lists mentioned above included only regular postal mail addresses. This research entailed approximately fifteen hours of work. Actually emailing the survey notices required approximately one and a half hours, both for the first and second notices.

The Survey

This study sought to survey a population experienced with electronic resources,[2] by electronic and paper surveys, about their attitudes toward NC LIVE, a new program to provide North Carolina academic and public libraries with collective access to a wide variety of electronic databases.[3] "NC LIVE is a statewide electronic library project of the libraries of North Carolina designed to strengthen the delivery of information statewide to enhance education, economic development, and the overall quality of life." (State of North Carolina, 1998) This program provides access to over 3,500 general magazines, journals and newspapers via approximately forty licensed databases, including several full text vendors such as ProQuest and EBSCOhost. The resources included cover a wide range of disciplines, from religion to politics, from psychology to recreation, and include general reference resources as well as subject-specific ones.

---

2 "Electronic resources" includes computers, electronic mail, electronic databases and other software.
3 Summary results of this survey are presented in Appendix E, since they are not the primary focus of this study.

The State Library, with its partners, introduced North Carolina Libraries for Virtual Education (NC LIVE) in the spring of 1998. Partners include public libraries and community college, private college and university libraries around the state. Although larger libraries already had access to some of the resources the partners decided to offer through the program, the cost benefit of consortially negotiated licenses made it attractive to join. A structured introductory program provided optional training to librarians across the state before and during the NC LIVE premier, and continues to provide workshops as needed. The paper survey is presented as Appendix A, and the printed version of the Web survey as Appendix B. The cover letter for the paper survey as well as the paper and email announcements of the Web survey appear in Appendix C.

Procedures for Distributing the Surveys

The paper survey and mail notice of the Web survey were sent several days ahead of the email notice of the Web survey in an effort to ensure that all instruments arrived at approximately the same time. Recipients of the paper survey were invited to complete the questionnaire and return it within one month, and received a follow up notice two weeks after the original mailing. Recipients of the paper and email notices of the Web survey were invited to complete the questionnaire within two weeks, and received a follow up notice after one week.

The Web survey was as nearly a duplicate of the paper instrument as possible. It was created using a combination of FrontPage 98, an HTML editor program, and direct HTML programming. The form for the Web survey was created with Gform, a program which relays a respondent's answers to the server on which the survey is mounted. The server, in turn, encodes the information as an email message to the address specified by

the researcher, including no information about the respondent. This ensured responses would be, not just confidential, but anonymous. Browsers do collect information about users as they respond to Web surveys, including their IP address and host domain (the specific address of the computer they use and the general address of the host, such as ".unc.edu"). It would be possible to collect this information and identify respondents' institutions if they use their work computer to respond, but it would be nearly impossible to discover the individual user (Dixon, 1999). Anonymity is complete, although this does present problems for any subsequent follow up. (If participants had been invited to include their email address voluntarily along with their responses, follow up would have been possible.)

Gform assisted in differentiation and coding, as well as anonymity. The two Web survey groups (paper notice and email notice) were directed to two separate but identical Web pages. The program enabled the researcher to insert identifying subject lines in the server's email indicating from which Web page the response had been submitted, clearly delineating the responses of the two groups. In addition, Gform will convey to the server whatever information a programmer associates with each answer, enabling coding to be assigned to each answer at the time the Web form is constructed. Although more advanced software is available which can deliver response information directly into a database file, working with Gform on this more basic level helped speed the manual data entry without the high cost of such software.

One significant difference between the electronic and paper versions of the survey concerned information about the respondent's library's Carnegie classification. In preliminary testing, many respondents were unsure of their library's category. In an

effort to boost response to this item, the Web survey linked to a Web site presenting a list of institutions in each category. This had significant unforeseen ramifications due to inadequate pre-testing. Shortly after the email announcement survey was sent, a respondent notified the researcher that following this link cleared all previously marked responses on the Web form. Since the classification question occurred at the end of the questionnaire, answers to virtually all questions were lost and it was annoying to have to do the entire survey again. A warning was immediately inserted about the problem on both survey Web pages, as well as a suggestion to open a separate browser window to follow the link; but several people had already responded without noticing and several responded subsequently with blank forms. The consequences of this problem are discussed further in the Results section.

Another problem which manifested itself in the data analysis concerned the question about respondents' primary work responsibilities. The original question invited respondents to note whether their primary work was technical, public service or managerial. In the Web survey the options were controlled by radio buttons, enabling a respondent to select only one answer. In the paper survey this preference for one answer wasn't expressed (e.g. "Select only one"), so a number of respondents marked more than one response. Handling of this problem will be discussed further in the Results section.

IV. Results

A total of 130 people responded to the survey overall, a response rate of 43.33%. 53 respondents had received the paper survey; 33 had received the mail announcement of the Web survey; and 44 had received the email announcement of the Web survey. Of the 53 paper responses, 51 were usable; of the 33 mail announcement responses, 27 were

usable; and of the 44 email announcement responses, 39 were usable. This results in an overall usable return rate of 39.33%. On the basis of these 118 usable responses, the usable paper survey response rate was 43.22%, the mail announcement rate 22.88%, and the email announcement rate 33.05%.

- Hypothesis 1: Respondents to the Web survey will not exhibit significantly different demographics from respondents to the paper survey.

Hypothesis 1 was not rejected. Tests of the three survey groups on variables relating to respondents' demographic characteristics found no significant differences (at a .05 level of significance) between respondents to the paper versus the Web survey. Demographic characteristics tested include age, sex, library education and amount of time respondents have worked in libraries among other things. Details of the tests are presented in Appendix 4.

- Hypothesis 2: Respondents to the Web survey will give responses that are not significantly different from responses to the paper survey; and
- Hypothesis 3: Respondents will not respond significantly differently to the Web survey whether they were notified of it by email or postal mail.

Hypothesis 2 was not rejected. The three survey groups were compared on the basis of variables relating to respondents' opinions about the NC LIVE program and those relating to respondents' computer experience. Opinion variables tested include five positive and four negative aspects of the NC LIVE program. Computer experience variables tested include questions about respondents' frequency of use of various kinds of electronic resources and home access to computers. The tests found no significant differences (at a .05 level of significance) between respondents to the paper versus the Web survey, except for one variable. An ANOVA demonstrated a significant relationship between the mean demand for computers prior to the start of the NC LIVE

program for responses from the three survey groups (F=37.769 with 2 df, p=0.000). The Bonferroni post-hoc analysis indicated a significant relationship only between the paper survey and the Web survey group notified by email (see Appendix D for more details). Details of the tests are presented in Appendix D.

On the basis of these same tests of variables relating to respondents' opinions about the NC LIVE program and those relating to respondents' computer experience, Hypothesis 3 was not rejected. The tests found no significant differences (at a .05 level of significance) among respondents to the Web survey, whether they were notified of it by mail or email.

One variable that at first appeared to show a difference between the Web and paper instruments was found to be not significant upon further analysis. In the data entry stage, with the goal of capturing as much information as possible, a fourth category was noted for the question about primary work, "combination," to make note of those paper surveys where the respondent had marked more than one category. In the preliminary data analysis stage, the fact that this fourth category was artificially weighted toward the paper survey was forgotten. An ANOVA seemed to indicate that those who marked "managerial" as their primary work were more likely to answer the paper survey. When the mistake was realized, the responses in this category were reclassified into the work category with the largest number of responses, forcing a somewhat artificial designation. So, for example, if someone marked both "technical" and "managerial" categories, the response was reclassified in the "managerial" set because there were more responses in that group than in the "technical" set. In re-running the significance tests, no

relationship was indicated between respondents' primary work category and their likelihood of answering via the Web or on paper.

- Hypothesis 4: The response rate of a Web survey will be no different from that of a paper survey.

Hypothesis 4 was rejected. The Web survey in this study did not have the same response rate as the paper survey. The paper survey achieved a response rate ten percentage points higher than the Web survey group notified by email and more than twenty percentage points higher than the Web survey group notified by mail. Certainly, to achieve a comparable response rate to a paper instrument, it is critical that the electronic survey be free of technical problems. The effects of the problem link from the Carnegie classification item in the Web survey were significant, invalidating 15.15% of the total response to the Web survey. Yet even if all responses to the Web survey had been valid, the Web survey's response rate would not have matched that of the paper survey. Consideration of the literature review seems to confirm this as a general trend for electronic surveys in comparison with paper surveys, whether the electronic survey is administered via email or the Web. Electronic surveys often seem to generate lower response rates than paper surveys, although the degree of difference between the two rates may vary according to how well each survey is promoted, what followup and motivational procedures are employed, and the general responsiveness of the population surveyed.

- Hypothesis 5: At least 50 percent of the total number of responses to the Web survey will be returned in one week.

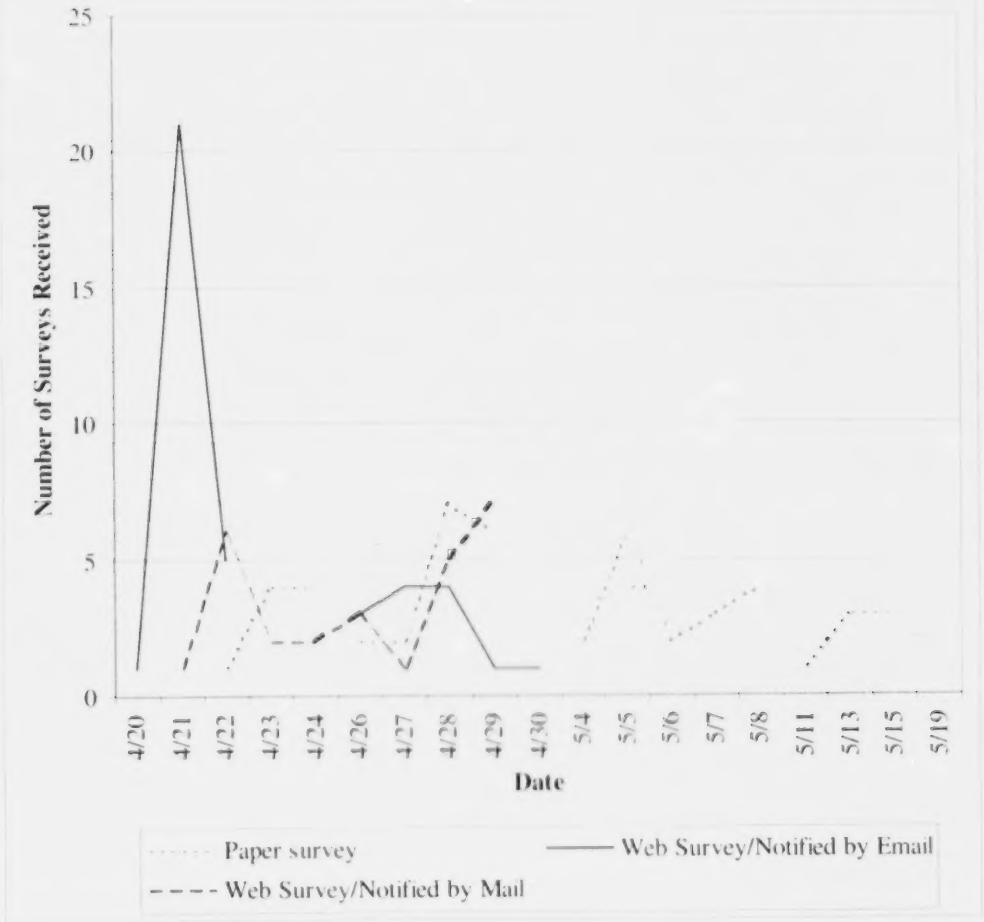
Hypothesis 5 was rejected. Fifty percent of responses to the Web survey were not received within one week. Only 27.5% of the total number of responses to the Web

survey was received within the first week. An ANOVA showed a clear relationship between the date the returned survey was received and which survey the respondent completed ($F=37.769$ with 2 df, $p=0.000$). Furthermore, a Bonferroni post-hoc analysis indicated a strong difference between the mean of the paper survey and those of both the Web survey groups ($p=.000$ for each comparison); however, there was no significant difference between the two Web survey groups (see Appendix D for more details).

Certainly, responses from the email announcement group were returned the fastest of the three groups. The first response was returned within an hour and a half of sending the announcement. Of the 52 responses received in the first seven days, 27 (65.85%) were from this group. Fourteen were from the Web survey/mail notice group, and eleven from the paper survey group (see Figure 1, next page).

The electronic returns did not have quite as large a lead over the paper returns as expected, however: while 30% of responses received from the Web survey notified by email group arrived by the seventh day from mailing, only 14% of the total from the Web survey notified by mail group were received by that time, compared to 21.57% of the total responses received from the paper survey group. (Only usable responses were counted for these calculations.) This may be in part because the paper surveys were mailed earlier in hopes that the paper and electronic instruments would be received at the same time.

Figure 1. Date Received (by Survey Group)



❖ Hypothesis 6: Of the two methods of publicizing a Web survey, postal mail and email, email is the more efficient one.

Hypothesis 6 was not rejected. The email notice of the Web survey was more efficient in eliciting responses than the mailed notice. An ANOVA demonstrated a significant relationship between the mean date received for responses from the three survey groups (F=37.769 with 2 df, p=0.000). However, the Bonferroni post-hoc

analysis indicated significant relationships only between the paper survey and each of the Web groups, not between the two Web groups (see Appendix D for more details).

V. Discussion

Comparisons of the demographics of the respondents to the Web and paper surveys found no significant differences between the demographic make up of the three survey groups. How old a person was, nor their sex, nor what degree of education they had attained influenced which survey they answered. Details of the tests are available in Appendix 4.

Comparisons of the responses to the Web and paper surveys found no significant differences between the content of responses from the three survey groups, except for one variable. Since no other variables showed significant differences between the responses to the paper and Web surveys, and since there was no difference between the mean demand for computers prior to the start of the NC LIVE program between the paper survey and the Web survey group notified by mail, this result is puzzling. Overall, attitude toward the NC LIVE program was not affected by the medium in which respondents answered, nor was there significant difference between the groups in terms of experience with electronic resources. Details of these tests and some further discussion are available in Appendix D.

The overall response rate was higher for the paper survey than for either of the Web survey groups (43.22% for the paper survey versus 33.05% for the Web survey notified by email and 22.88% for the Web survey notified by regular mail). When only the most thorough method will do and a high response rate is critical, paper and pencil

still hold the lead over electronic means as a survey method. Considerations for future researchers will include time constraints, cost, and the motivation of participants to respond. Significantly more responses were received to the paper survey than to the Web survey. Paper surveys remain a more productive medium for response, even among an electronically proficient community.

Response from the Web survey groups was faster overall than from the paper survey group, but not by as wide a margin as originally expected. Counting only usable responses, 30% of responses received from the Web survey notified by email group arrived by day seven, but only 14% from the Web survey notified by mail group, compared to 21.57% of the total responses received from the paper survey group which arrived by day seven. Promotion of the Web survey was clearly accomplished more efficiently via email than mail. Even before discounting unusable responses, the email group filling out the Web survey was more likely to respond than the mail group. It seems likely that the better early response to the Web survey is partly due to its earlier deadline. The cover letter/email made clear that responses were requested by May 1, and respondents clearly made an effort to comply with that. It would be interesting to compare long-term response with identical deadlines.

The most significant difference between the two instruments from a data standpoint was the flexibility the paper instrument provided respondents in how they answered. Respondents felt free to make comments about questions they didn't understand or felt were ambiguous. They often provided different answers to the same question to illustrate the different ways of interpreting it. The Web survey forced respondents to answer in particular ways, with no easy means for providing comments.

Confusion on the part of the researcher over the significance of respondents' primary work category arose because respondents to the paper survey were able to mark more than one answer to the question, whereas the web survey respondents were permitted only one choice by the radio button answer selector. Choice of radio buttons or check boxes gives researchers a greater amount of control over how they want respondents to answer questions, but it also results in receipt of less information overall from the respondents. It might have been very important for the study to know that some academic librarians have combinations of different kinds of work in their jobs. If only the Web survey had been administered, this fact would not have come to light at all.

For this population, the use of Web surveys seems a reasonable alternative to postal surveys or telephone interviews, depending on the research question. Clearly, the response rate in this study is rather low. Dillman (1978) notes that a response rate such as that achieved for the Web survey group notified by email—33%—leaves the majority of the population unsurveyed. If the survey in some way discouraged from responding people who all felt the same way, the majority opinion would remain unrepresented by these results. Given that no significant difference was found between survey groups on the basis of the demographic variables (see Appendix D), it is unlikely that such glaring bias would exist among the non-respondents. It is, however, a possibility. Further research into what motivations can be used effectively with electronic surveys would be useful.

Technical Difficulties

Perhaps the greatest caveat this study offers for future Web surveys is to caution that survey authors find expert consultation on the technical aspects of the survey and

conduct fully as thorough a pre-test on an electronic survey as on a paper instrument, even if they include exactly the same items. Smith (1997) provided the only comparison of email and Web surveys found in this study, but she encountered serious technical difficulties in publishing her Web survey to the extent that she was unable to gather sufficient data to make a meaningful comparison between the two modes. Her survey format was incompatible with at least two types of Internet browsers, preventing respondents from submitting their completed surveys. Due to inadequate pre-testing of the electronic instrument for the current study, a significant number of responses to the Web survey were lost. Researchers should be very sure they have anticipated and diagnosed as many technical issues as possible. A few other possible problems, among many, include the way in which the questions are displayed by different browsers, whether different browsers can interpret the form protocol used, and problems with early generation computers interpreting advanced applications, such as Javascript and frames.

VI. Conclusion

The advantages the Web survey holds in administration time and cost almost force researchers to consider it as a serious alternative to more traditional survey media. Miller et al. (1996) suggested the efficiency of electronic data collection method justified its use, particularly for exploratory research and for populations that have no sampling frame. However, I would disagree. The greater freedom paper instruments offer respondents should be an important consideration, particularly for exploratory research. Of course researchers must weigh many factors in choosing an appropriate survey medium, but when cost and time constraints outweigh other considerations, the

Web may be an adequate medium if sufficient comment areas are supplied within the survey form and the sampling frame for the population is not biased.

Bibliography

Anderson, Susan E., and Gansneder, Bruce M. (1995). Using electronic mail surveys and computer-monitored data for studying computer-mediated communication systems. *Social Science Computer Review, 13*(1), 33-47.

Babbie, Earl. (1998). The Practice of Social Research. Belmont, CA: Wadsworth Publishing Company.

Bachmann, Duane, Elfrink, John and Vazzana, Gary (1996). Tracking the progress of e-mail versus snail-mail: gap narrows on response rates, but applications still limited. *Marketing Research, 8*(2), 31-35.

Berge, Zane L., and Collins, Mauri P. (1996). IPCT journal readership survey. *Journal of the American Society for Information Science, 47*(9), 701-710.

Bertot, John C., and McClure, Charles R. (1996). Electronic surveys: methodological implications for using the World Wide Web to collect survey data. *ASIS Proceedings, 33*, 173-185.

Booth-Kewley, Stephanie, Edwards, Jack E., and Rosenfeld Paul (1992). Impression management, social desirability, and computer administration of attitude questionnaires: Does the computer make a difference? *Journal of Applied Psychology, 77*(4), 562-566.

Clayton, Peter, Applebee, Andrelyn and Pascoe, Celina (1996). Email surveys: old problems with a new delivery medium. *LASIE: Information Bulletin of the Library Automated Systems Information Exchange, 27*, 30-39.

Dillman, Don A. (1978). *Mail and Telephone Surveys: The Total Design Method*. New York: John Wiley and Sons.

Dixon, Philip. Personal correspondence, October 13 and November 3, 1999.

Erdman, Harold, Klein, Marjorie H., and Greist, John H. (1983). The reliability of a computer interview for drug use/abuse information. *Behavior Research Methods and Instrumentation, 15*(1), 66-68.

Gazel, Ricardo C., and Schwer, R. Keith (1998). Interview mode choice by survey respondents: a methodological analysis. *Social Science Computer Review, 16*(2), 185-191.

GVU Center. (1998). *GVU's 10th WWW User Survey*. College of Computing, Georgia Institute of Technology. [Online, November 1, 1999]. Available: http://www.gvu.gatech.edu/user_surveys/survey-1998-10/.

Helgeson, James G. and Ursic, Michael L. (1989). The decision process equivalency of electronic versus pencil and paper data collection methods. *Social Science Computer Review, 7*(3), 296-310.

Kaufman, Judith S., Carlozzi, Alfred F., Boswell, Donald L., Barnes, Laura L.B., Wheeler-Scruggs, Kathy and Levy, Patricia A. (1997). Factors influencing therapist selection among gays, lesbians and bisexuals. *Counseling Psychology Quarterly, 10*(3), 287-297.

Kiesler, Sara, and Sproull, Lee (1986). Response effects in the electronic survey. *Public Opinion Quarterly, 50*(3), 402-413.

Meehan, Merrill L. and Burns, Rebecca C. (1997, March). *E-mail survey of a listserv discussion group: lessons learned from surveying an electronic network of learners*. Paper presented at the annual meeting of the American Educational Research Association, Chicago, IL.

Mehta, Raj and Sivadas, Eugene (1995). Comparing response rates and response content in mail versus electronic mail surveys. *Journal of the Market Research Society, 37*(4), 429-439.

Miller, James, Daly, John, Wood, Murray, Brooks, Andrew, and Roper, Marc (1996). Electronic bulletin board distributed questionnaires for exploratory research. *Journal of Information Science, 22*(2), 107-115.

Morphew, Christopher C. and Williams, Andrew N. (1998). Using electronic mail to assess undergraduates' experiences: assessing frame and mode effects. *Journal of Computing in Higher Education, 10*(1), 38-55.

Pitkow, James E. (1996). Emerging trends in the WWW user population. ***Communications of the ACM***, *39*(6) 106-108.

Roselle, Ann and Neufeld, Steven (1998). The utility of electronic mail follow-ups for library research. *Library and Information Science Research, 20*(2), 153-161.

Shaw, Debora, and Davis, Charles H. (1996). The Modern Language Association: electronic and paper surveys of computer-based tool use. *Journal of the American Society for Information Science, 47*(12), 932-940.

Skinner, Harvey A., and Allen, Barbara A. (1983). Does the computer make a difference? Computerized versus face-to-face versus self-report assessment of alcohol, drug and tobacco use. *Journal of Consulting and Clinical Psychology, 51*(2), 267-275.

Smith, Christine B. (1997). Casting the `Net: surveying an Internet population. *Journal of Computer Mediated Communication* [Online, July 26, 1999], *3*(1). Available: http://jcmc.mscc.huji.ac.il/vol3/issue1/smith.html.

Sproull, Lee (1986). Using electronic mail for data collection in organizational research. *Academy of Management Journal*, *29*(1), 159-169.

State of North Carolina. NC LIVE Interim Memorandum of Understanding. [Online, November 17, 1998]. Available: http://www.nclive.org/backgrnd/mou.pdf.

Swoboda, Walter J., Mühlberger, Nikolai, Weitkunat, Rolf, and Schneeweib, Sebastian (1997). Internet surveys by direct mailing. *Social Science Computer Review, 15*(3), 242-255.

Synodinos, Nicolaos E., Papacostas, C.S., and Okimoto, Glenn M. (1994). Computer administered versus paper-and-pencil surveys and the effect of sample selection. *Behavior Research Methods, Instruments and Computers, 26*(4), 395-401.

Thach, Liz (1995). Using electronic mail to conduct survey research. *Educational Technology, 35*(2), 27-31.

Walsh, John P., Kiesler, Sara, Sproull, Lee S., and Hesse, Bradford W. (1992). Self-selected and randomly selected respondents in a computer network survey. *Public Opinion Quarterly, 56*(2), 241-244.

Survey of Academic Librarians' Experience with NC LIVE

PLEASE RETURN BY MAY 15

Your submission of the completed questionnaire will be taken as an indication of your consent to participate.

Section I – NC LIVE[†]

1. If you are currently employed in an academic library, does it have NC LIVE access? Yes ❑ No ❑

2. a. If you answered yes to question 1, how long has your library had NC LIVE? _____ months

   b. If you answered no to question 1, do you know when you will get access to it? _____ (month, year) *--Please proceed to Section II, at the bottom of the next page.*

3. In your view, what are the greatest benefits of having NC LIVE? *Please check all that apply.*

   ❑ Helps staff learn more electronic resources
   ❑ Encouragement of patrons to explore electronic resources
   ❑ Provides a marketing tool to promote the library to the community
   ❑ Greater variety of resources for patrons
   ❑ Brings more people into the library
   ❑ Other: _____

4. In your view, what are the greatest detriments of having NC LIVE? *Please check all that apply.*

   ❑ Additional bibliographic instruction demands on staff
   ❑ Heavy demand for computers
   ❑ Strains staff coverage at the reference desk
   ❑ Increases patron reliance on electronic resources even when print resources are more appropriate
   ❑ Other: _____

5. How many public computer stations in the library where you work give patrons access to NC LIVE? _____

6. Can patrons access multiple software applications on these computer stations, including software like word-processing programs? Yes ❑ No ❑

7. If yes, please check software applications available. *Please check all that apply.*

   ❑ Word-processing ❑ Spreadsheet program ❑ Internet ❑ Library OPAC

   ❑ Scanning programs (image or text) ❑ Other: _____

8. Assess the level of demand for the library's public computer stations before NC LIVE was available (1 is least; 5 is greatest).

   1 less than 5 users per hour at peak periods — 2 — 3 — 4 — 5 more than 20 users per hour at peak periods

[†] NC LIVE Mission Statement: "NC LIVE (North Carolina Libraries for Virtual Education) is a statewide electronic library project of the libraries of North Carolina designed to strengthen the delivery of information statewide to enhance education, economic development, and the overall quality of life. Working together, the libraries represented by the State Library of North Carolina, The University of North Carolina, The North Carolina Community College System, and the North Carolina Center for Independent Higher Education will collaborate to give all North Carolinians--students, faculty, business people, and residents in all walks of life--equal access to a range of electronic information resources and to the resources housed in libraries statewide." **For more information**, see the State Library web site at http://statelibrary.dcr.state.nc.us/ and select "NC LIVE" from the Quick Links menu.

Section I – NC LIVE (continued)

9. Assess the level of demand for these stations now with NC LIVE (1 is least; 5 is greatest).

1 less than 5 users per hour at peak periods | 2 | 3 | 4 | 5 more than 20 users per hour at peak periods

10. Assess your own frequency of use of electronic indexes either on CD-ROM or via the Internet (e.g., ERIC, Psychlit, MEDLINE) per hour at the reference desk prior to gaining NC LIVE (1 is least; 5 is greatest). Do not include uses of the library's online catalog.

1 less than 2 uses per hour | 2 | 3 | 4 | 5 more than 10 uses per hour

11. Assess your own frequency of use of electronic indexes through NC LIVE per hour at the reference desk (1 is least; 5 is greatest).

1 less than 2 uses per hour | 2 | 3 | 4 | 5 more than 10 uses per hour

12. Which resources within NC LIVE do you refer patrons to most frequently? _____

_____

13. How many databases in NC LIVE do you personally use regularly? _____

14. Which ones do you use most frequently? _____

_____

15. Has NC LIVE increased the amount of bibliographic instruction you provide to patrons?

No ❑ Yes ❑

16. If yes, how? *Please check all that apply.* ❑ time spent with individual patrons ❑ number of group classes taught

❑Other: _____

17. How much in-class training have you had in using NC LIVE (in hours)? _____

18. Do you feel these workshops have provided sufficient training? Yes ❑ No ❑

Section II – Electronic Library Services/Experience

Please indicate whether the library where you work offers patrons the following kinds of access:

	Offer?	
	Yes	No
1. Graphics-based World Wide Web searching/browsing (*e.g., using Netscape, Mosaic or Explorer software*)		
2. Text-based World Wide Web browsing (*e.g., using Lynx software*)		
3. Email accounts		
4. Newsgroup services (*e.g., access to newsgroup readers*)		

2

Section II – Electronic Library Services/Experience (continued)

		Offer?	
		Yes	No
5.	Library's catalog online		
6.	Computing software *(e.g., word-processing or spreadsheet programs)*		
7.	Other - *Please specify:*		

8. Which unit below best describes the frequency with which you have referred to electronic literature databases, either on CD-ROM or via the Internet, during reference desk work in the last year?

Every hour ❑ Every day ❑ Every week ❑ Every month ❑

9. Which unit below best describes the frequency with which you currently use such databases during reference desk work?

Every hour ❑ Every day ❑ Every week ❑ Every month ❑

Please estimate the number of times you use each of the following electronic resources at work but **outside** of reference desk service in a typical week:

		Times Per Week				
		Never	Less than 10	11-25	26-50	More than 50
10.	World Wide Web access *(e.g., research or surfing)*					
11.	Electronic mail					
12.	Listservs/Newsgroups					
13.	Searching or maintaining your library's online catalog					
14.	Computing software *(e.g., word-processing or spreadsheet programs)*					
15.	Other - *Please specify:*					

Section III – Demographic Information

1. Age: 24 or below ❑ 25-34 ❑ 35-44 ❑ 45-54 ❑ 55-64 ❑ 65 or above ❑

2. Sex: Male ❑ Female ❑

3. Is English your first language? Yes ❑ No ❑ If no, what is your first language? _____

Section III – Demographic Information (continued)

4. Please check your highest level of **library** education completed: Paraprofessional library training ❑

   Associate's degree ❑ Bachelor's degree ❑ M.L.S. ❑ Ph.D. ❑

5. Please list any other **non-library** degrees you hold. _____

6. Are you currently employed more than 30 hours in a academic library? Yes ❑ No ❑

7. If so, how long have you worked in that library? Years ____ Months ____

8. Overall, how long have you worked full-time in libraries (this one plus any other libraries where you may have been employed full-time)? Years ____ Months ____

9. What is your job title? _____

10. How many hours each week do you work at the reference desk?

    5 or less ❑ 6-10 ❑ 11-15 ❑ 16-20 ❑ 21-30 ❑ 30 or more ❑

11. Would you categorize your work as primarily public service (reference) ❑, primarily technical ❑, or primarily managerial ❑?

12. If you answered "public service" above, do you mainly provide service to ❑ students ❑ faculty or ❑ members of the larger community?

13. If you are currently working in an academic library, what is its Carnegie classification?

    ❑ Research University I
    ❑ Doctoral University II
    ❑ Research University II
    ❑ Master's (Comprehensive) University/College I
    ❑ Doctoral University I
    ❑ Master's (Comprehensive) University/College II
    ❑ Baccalaureate (Liberal Arts) College I
    ❑ Professional School/Specialized Institution
    ❑ Baccalaureate (Liberal Arts) College II
    ❑ Associate of Arts College

14. If you are currently working in an academic library, is it: ❑ the main campus library or ❑ a departmental library (health sciences, law, art, etc.)?

15. If you are currently working in a academic library, what is the size of the library's collection? _____ volumes

16. Do you have your own computer at home? Yes ❑ No ❑

17. If yes, do you use it more than once a week? Yes ❑ No ❑

18. If you have a computer at home, do you have email access of any sort at home? Yes ❑ No ❑

19. If yes, do you use it more than once a week? Yes ❑ No ❑

20. Do you have Internet access at home? Yes ❑ No ❑

21. If yes, do you use it more than once a week? Yes ❑ No ❑

22. Do you have your own computer at work? Yes ❑ No ❑

--End of the Survey--

Thank you for Participating!

Please return this survey to:

M. Matz
602 Airport Rd., Apt. 205
Chapel Hill, NC 27514

Survey of Academic Librarians' Experience with NC LIVE

Obligatory Consent Notice

- This survey is part of a SILS master's paper project meant to glean information about the use of NCLIVE in academic libraries. Your help in filling out this survey will provide valuable information about the impact on academic library staffing of the public's increased access to electronic resources, as well as about aspects of electronic research. This survey has been announced to reference librarians in academic libraries across North Carolina.

- This survey is completely voluntary and confidential. Responses are sent to my personal email address. No identifying numbers, names, or other personal information will be recorded in any fashion.

- You have the right not to answer any question(s) that you prefer not to answer.

- Questions regarding the research may be directed to Michele Matz (matzm@ils.unc.edu).

- Questions regarding your rights as participants in the research may be directed to:

  Academic Affairs Institutional Review Board

  David A. Eckerman, Chair

  CB# 4100, 201 Bynum Hall

  The University of North Carolina at Chapel Hill

  Chapel Hill, North Carolina 27599-4100

  (919) 962-7761

  email: aa-irb-chair@unc.edu

- If you would like to request the results of this study, email Michele Matz (matzm@ils.unc.edu). This email will not be associated with your survey response.

Proceed to the Survey

Survey of Academic Librarians' Experience with NC LIVE

PLEASE COMPLETE BY MAY 1

Section I – NC LIVE

1. If you are currently employed in an academic library, does it have NC LIVE access?

○ Yes ○ No

2. a. If you answered yes to question 1, how long has your library had NC LIVE?

_____ months

b. If you answered no to question 1, do you know when you will get access to it?

_____ (month, year) *--Please proceed to Section II.*

3. In your view, what are the greatest benefits of having NC LIVE? *Please check all that apply.*

☐ Helps staff learn more electronic resources

☐ Greater variety of resources for patrons

☐ Encouragement of patrons to explore electronic resources

☐ Brings more people into the library

☐ Provides a marketing tool to promote the library to the community

☐ Other: _____

4. In your view, what are the greatest detriments of having NC LIVE? *Please check all that apply.*

- ☐ Additional bibliographic instruction demands on staff
- ☐ Increases patron reliance on electronic resources even when print resources are more appropriate
- ☐ Heavy demand for computers
- ☐ Strains staff coverage at the reference desk
- ☐ Other: _____

5. How many public computer stations in the library where you work give patrons access to NC LIVE? _____

6. Can patrons access multiple software applications on these computer stations, including software like word-processing programs?

Yes ○ No ○

7. If yes, please check software applications available. *Please check all that apply.*

- ☐ Word-processing
- ☐ Library OPAC
- ☐ Internet
- ☐ Spreadsheet program
- ☐ Scanning programs (image or text)
- ☐ Other: _____

8. Assess the level of demand for the library's public computer stations before NC LIVE was available (1 is least; 5 is greatest).

○ 1 ○ 2 ○ 3 ○ 4 ○ 5

(less than 5 users per hour at peak periods) (more than 20 users per h at peak perio

9. Assess the level of demand for these stations now with NC LIVE (1 is least; 5 is greatest).

○ 1 ○ 2 ○ 3 ○ 4 ○ 5

(less than 5 users per hour at peak periods) (more than 20 a

10. Assess your own frequency of use of electronic indexes either on CD-ROM or via the Internet (e.g., ERIC, Psychlit, MEDLINE) per hour at the reference desk prior to gaining NC LIVE (1 is least; 5 is greatest). Do not include uses of the library's online catalog.

○ 1 ○ 2 ○ 3 ○ 4 ○ 5

(less than 2 uses per hour (more than 1(

11. Assess your own frequency of use of electronic indexes through NC LIVE per hour at the reference desk (1 is least; 5 is greatest).

○ 1 ○ 2 ○ 3 ○ 4 ○ 5

(less than 2 uses per hour (more than 1(

12. Which resources within NC LIVE do you refer patrons to most frequently?

13. How many databases in NC LIVE do you personally use regularly?

14. Which ones do you use most frequently?

15. Has NC LIVE increased the amount of bibliographic instruction you provide to patrons? No ○ Yes ○

16. If yes, how? *Please check all that apply.*

☐ time spent with individual patrons ☐ number of group classes taugh
☐ Other:

17. How much in-class training have you had in using NC LIVE (in hours)?

hours

18. Do you feel these workshops have provided sufficient training?

Yes ○ No ○

Section II – Electronic Library Services/Experience

Please indicate whether the library where you work offers patrons the following kinds of access:

	Offer?	
	Yes	N
1. Graphics-based World Wide Web searching/browsing (*e.g., using Netscape, Mosaic or Explorer software*)	○	○
2. Text-based World Wide Web browsing (*e.g., using Lynx software*)	○	○
3. Email accounts	○	○

4. Newsgroup services (*e.g., access to newsgroup readers*)	○	○
5. Library's catalog online	○	○
6. Computing software (*e.g., word-processing or spreadsheet programs*)	○	○
7. Other - *Please specify*:	○	○

8. Which unit below best describes the frequency with which you have referred to electronic literature databases, either on CD-ROM or via the Internet, during reference desk work in the last year?

Every hour ○ Every day ○ Every week ○ Every month ○

9. Which unit below best describes the frequency with which you currently use such databases during reference desk work?

Every hour ○ Every day ○ Every week ○ Every month

Please estimate the number of times you use each of the following electronic resources at work but **outside** of reference desk service in a typical week:

	Times Per Week				
	Never	Less than 10	11-25	26-50	More than 50
10. World Wide Web access (*e.g., research or surfing*)	○	○	○	○	○
11. Electronic mail	○	○	○	○	○
12. Listservs/Newsgroups	○	○	○	○	○
13. Searching or maintaining your library's online catalog	○	○	○	○	○
14. Computing software (*e.g., word-processing or spreadsheet programs*)	○	○	○	○	○
15. Other - *Please specify*:	○	○	○	○	○

Section III – Demographic Information

1. What is your age?

○ 24 or below	○ 25-34	○ 35-44
○ 45-54	○ 55-64	○ 65 or above

2. What is your gender? Male ○ Female ○

3. Is English your first language? Yes ○ No ○

   If no, what is your first language? _____

4. Please check your highest level of **library** education completed:

○ Paraprofessional library training	○ Associate's degree
○ Bachelor's degree	○ M.L.S.
○ Ph.D.	

5. Please list any other **non-library** graduate degrees you hold.

   _____

6. Are you currently employed more than 30 hours in an academic library?

   Yes ○ No ○

7. If so, how long have you worked in that library?

Years ⌜ ⌝ Months ⌜ ⌝

8. Overall, how long have you worked full-time in libraries (this one plus any other libraries where you may have been employed full-time)?

Years ⌜ ⌝ Months ⌜ ⌝

9. What is your job title?

⌜ ⌝

10. How many hours each week do you work at the reference desk?

- ○ 5 or less
- ○ 6-10
- ○ 11-15
- ○ 16-20
- ○ 21-30
- ○ 30 or more

11. Would you categorize your work as:

- ○ primarily public service (reference),
- ○ primarily technical, or
- ○ primarily managerial ?

12. If you answered "public service" above, do you mainly provide service to

- ○ students,
- ○ faculty or
- ○ members of the larger community?

13. If you are currently working in an academic library, what is its Carnegie classification? (*Part I on this page lists institutions in each category but following this link will clear your form. You might want to open a separate browser frame to check it.*)

○ Research University I	○ Research University II	○ Doctoral University I
○ Doctoral University II	○ Master's (Comprehensive) University/College I	○ Master's (Comprehensi University/College II
○ Baccalaureate (Liberal Arts) College I	○ Baccalaureate (Liberal Arts) College II	○ Associate of Arts Colle
○ Professional School/Specialized Institution		

14. If you are currently working in an academic library, is it

○ the main campus library or

○ a departmental library (health sciences, law, art, etc.)?

15. If you are currently working in an academic library, what is the size of the library's collection?

[ ] volumes

16. Do you have your own computer at home? Yes ○ No ○

17. If yes, do you use it more than once a week? Yes ○ No ○

18. If you have a computer at home, do you have email access of any sort at home? Yes ○ No ○

19. If yes, do you use it more than once a week? Yes ○ No ○

20. Do you have Internet access at home? Yes ○ No ○

21. If yes, do you use it more than once a week? Yes ○ No ○

22. Do you have your own computer at work? Yes ○ No ○

23. Did you complete this survey

○ at work, ○ at home or ○ at another location?

24. How did you hear about this survey?

○ Mail announcement ○ Email announcement

○ From a colleague ○ Other *(Please specify)*: _____

End of the Survey

If you would like to review your answers before submitting them, please return to the top of the survey now to do so, prior to clicking the submission button below.

Submit your completed survey now

Clear Form **NOTE:** This button clears the form completely to let you start again.

Thank you for your time!

BEST COPY AVAILABLE

20. Do you have Internet access at home? Yes ○ No ○

21. If yes, do you use it more than once a week? Yes ○ No ○

22. Do you have your own computer at work? Yes ○ No ○

23. Did you complete this survey

○ at work, ○ at home or ○ at another location?

24. How did you hear about this survey?

○ Mail announcement ○ Email announcement

○ From a colleague ○ Other *(Please specify)*: _____

End of the Survey

If you would like to review your answers before submitting them, please return to the top of the survey now to do so, prior to clicking the submission button below.

Submit your completed survey now

Clear Form **NOTE:** This button clears the form completely to let you start again.

Thank you for your time!

BEST COPY AVAILABLE

THE UNIVERSITY OF NORTH CAROLINA

AT

CHAPEL HILL

School of Information and Library Science
Phone# (919) 962-8366
Fax# (919) 962-8071

The University of North Carolina at Chapel Hill
CB# 3360, 100 Manning Hall
Chapel Hill, N.C. 27599-3360

April 19, 1999

Dear Academic Librarian:

I am conducting a survey for my master's thesis of the impact NC LIVE has on patrons' use of electronic services in academic libraries. The objective of this research project is to understand the impact on academic library staffing of the public's increased access to electronic resources, as well as to study aspects of electronic research. Understanding the impact of programs like NC LIVE is important for planning future services, as well as for managing support of this program.

Enclosed is a questionnaire posing a variety of questions about your experience with NC LIVE, as well as with computers and electronic resources in general. Please look over the questionnaire. You signify your willingness to participate by completing and returning the survey in the enclosed stamped and self-addressed envelope *no later than May 15, 1999*. The results of this study will be summarized and published in aggregate form only. Your responses will be held in strictest confidence and will not be identified with you as an individual.

Please take about ten minutes to answer this questionnaire and return it. Your willingness to share your experiences will be of value not only to my research, but may provide a better understanding of the public's use of NC LIVE as we come to the close of its first academic year. If you don't feel you spend enough time at the reference desk to answer this survey, please pass it along to someone else on your staff.

If you have questions or concerns about your rights as a research subject, you may contact my advisor, Dr. Barbara Wildemuth, at 962-0872 or email wildemuth@ils.unc.edu; or the UNC-CH Academic Affairs Institutional Review Board at the following addresses or telephone number.

Academic Affairs Institutional Review Board, David A. Eckerman, Chair
CB# 4100, 201 Bynum Hall
The University of North Carolina at Chapel Hill
Chapel Hill, North Carolina 27599-4100
(919) 962-7761
email: aa-irb-chair@unc.edu

Thank you for your help. If you would like to receive a summary of the findings of this study, simply return the enclosed address form.

Sincerely,

Michele Matz
M.S.L.S. Candidate
School of Information and Library Science
(919) 942-7828

THE UNIVERSITY OF NORTH CAROLINA
AT
CHAPEL HILL

School of Information and Library Science
Phone# (919) 962-8366
Fax# (919) 962-8071

The University of North Carolina at Chapel Hill
CB# 3360, 100 Manning Hall
Chapel Hill, N.C. 27599-3360

April 19, 1999

Dear Academic Librarian:

I am conducting a survey for my master's thesis of the impact NC LIVE has on patrons' use of electronic services in academic libraries. The objective of this research project is to understand the impact on academic library staffing of the public's increased access to electronic resources, as well as to study aspects of electronic research. Understanding the impact of programs like NC LIVE is important for planning future services, as well as for managing support of this program.

I am administering this survey on a web page located at **http://ils.unc.edu/matz/NCLIVE/**, where it will be posted until May 1st. The questionnaire poses a variety of questions about your experience with NC LIVE, as well as with computers and electronic resources in general. Please look it over. You signify your willingness to participate by completing and returning the survey electronically *no later than May 1, 1999*. The results of this project will be summarized and published in aggregate form only. Your responses will be held in strictest confidence and will not be identified with you as an individual.

Please take about ten minutes to answer this questionnaire and return it electronically. Your willingness to share your experiences will be of value not only to my research, but may provide a better understanding of the public's use of NC LIVE as we come to the close of its first academic year. If you don't feel you spend enough time at the reference desk to answer this survey, please pass this message along to someone else on your staff.

If you have questions or concerns about your rights as a research subject, you may contact my advisor, Dr Barbara Wildemuth, at 962-0872 or email wildemuth@ils.unc.edu; or the UNC-CH Academic Affairs Institutional Review Board at the following addresses or telephone number.

Academic Affairs Institutional Review Board, David A. Eckerman, Chair
CB# 4100, 201 Bynum Hall
The University of North Carolina at Chapel Hill
Chapel Hill, North Carolina 27599-4100
(919) 962-7761
email: aa-irb-chair@unc.edu

Thank you for your help. If you would like to receive a summary of the findings of this study, simply return the enclosed address form.

Sincerely,

Michele Matz
M.S.L.S. Candidate
School of Information and Library Science
(919) 942-7828

April 20, 1999

Dear Academic Librarian:

I am conducting a survey for my master's thesis of the impact NC LIVE has on patrons' use of electronic services in academic libraries. The objective of this research project is to understand the impact on academic library staffing of the public's increased access to electronic resources, as well as to study aspects of electronic research. Understanding the impact of programs like NC LIVE is important for planning future services, as well as for managing support of this program.

I am administering this survey on a web page located at **http://ils.unc.edu/matz/survey/**, where it will be posted until May 1st. The questionnaire poses a variety of questions about your experience with NC LIVE, as well as with computers and electronic resources in general. Please look it over. You signify your willingness to participate by completing and returning the survey electronically *no later than May 1, 1999*. The results of this project will be summarized and published in aggregate form only. Your responses will be held in strictest confidence and will not be identified with you as an individual.

Please take about ten minutes to answer this questionnaire and return it electronically. Your willingness to share your experiences will be of value not only to my research, but may provide a better understanding of the public's use of NC LIVE as we come to the close of its first academic year. If you don't feel you spend enough time at the reference desk to answer this survey, please pass this message along to someone else on your staff.

If you have questions or concerns about your rights as a research subject, you may contact my advisor, Dr. Barbara Wildemuth, at 962-0872 or email wildemuth@ils.unc.edu; or the UNC-CH Academic Affairs Institutional Review Board at the following addresses or telephone number.

Academic Affairs Institutional Review Board
David A. Eckerman, Chair
CB# 4100, 201 Bynum Hall
The University of North Carolina at Chapel Hill
Chapel Hill, North Carolina 27599-4100
(919) 962-7761
email: aa-irb-chair@unc.edu

Thank you for your help. If you would like to receive a summary of the findings of this study, simply return this email to me with your name and mailing address.

Sincerely,

Michele Matz
M.S.L.S. Candidate
School of Information and Library Science
(919) 942-7828

Appendix D

Selected Statistical Test Results

One-way analysis of variance and chi-square tests were used to compare individual variables over the three survey groups. A Bonferroni post-hoc analysis was used to analyze the significant ANOVA. Spearman's rho correlations were used to test relationships among ordinal data. Pearson correlations were used to test relationships among interval data.

Tests for Hypothesis 1

- Hypothesis 1: Respondents to the Web survey will not exhibit significantly different demographics from respondents to the paper survey.

Ns are presented for each test.

==========

Section III

1. Age: 24 or below ⌟ 25-34 ⌟ 35-44 ⌟ 45-54 ⌟ 55-64 ⌟ 65 or above ⌟

		Survey Groups			Total
		paper	email/web	mail/web	
	24 or below	0	0	0	0
	25-34 years	8	10	2	20
	35-44 years	7	6	8	21
	45-54 years	29	15	15	59
	55-64 years	7	9	2	18
	65 or above	0	0	0	0
Total		51	40	27	N=118

χ^2=10.245, with 6 df, p=.115

==========

Section III

2. Sex: Male ⌟ Female ⌟

		Survey Groups			Total
		paper	email/web	mail/web	
	male	13	10	10	33
	female	37	30	17	84
Total		50	40	27	N=117

χ^2=1.36, with 2 df, p=.506

==========

Section III

4. Please check your highest level of **library** education completed:

Paraprofessional library training ❑ Associate's degree ❑ Bachelor's degree ❑
M.L.S. ❑ Ph.D. ❑

		Survey Groups			Total
Library education level		paper	email/web	mail/web	
	paraprof	2	4	0	6
	Assoc	2	0	0	2
	BA	1	0	0	1
	MLS	46	36	27	109
	PhD	0	0	0	0
Total		51	40	27	N=118

χ^2=7.57 with 6 df, p=.271

==========

Section III

8. Overall, how long have you worked full-time in libraries (this one plus any other libraries where you may have been employed full-time)? Years ____ Months ____

	r	P
Time employed in libraries	-.054	.563

(N=117)

==========

Section III

10. How many hours each week do you work at the reference desk?

5 or less ❑ 6-10 ❑ 11-15 ❑ 16-20 ❑ 21-30 ❑ 30 or more ❑

		Survey Groups			Total
		paper	email/web	mail/web	
	<5 hours	4	8	1	13
	6-10 hours	15	6	10	31
	11-15 hours	15	14	8	37
	16-20 hours	9	2	2	13
	21-30 hours	4	3	3	10
	>30 hours	4	6	3	13
Total		51	39	27	N=117

χ^2=13.33, with 10 df, p=.206

==========

Section III

11. Would you categorize your work as primarily public service (reference) ❑ primarily technical ❑ or primarily managerial ❑?

		Survey Groups			Total
		paper	email/web	mail/web	
	public service	27	28	19	74
	Technical	13	6	1	20
	managerial	10	6	7	23
Total		50	40	27	N=117

χ^2=7.420, with 4 df, p=.115

==========

Section III

13. If you are currently working in an academic library, what is its Carnegie classification?

❑ Research University I
❑ Research University II
❑ Doctoral University I
❑ Doctoral University II
❑ Master's (Comprehensive) University/College I
❑ Master's (Comprehensive) University/College II
❑ Baccalaureate (Liberal Arts) College I
❑ Baccalaureate (Liberal Arts) College II
❑ Associate of Arts College
❑ Professional School/Specialized Institution

		Survey Groups			Total
Carnegie classification		paper	email/web	mail/web	
	Rsrch1	2	7	2	11
	Rsrch2	0	1	0	1
	Doc1	4	2	2	8
	Doc2	5	2	2	9
	MA1	2	6	4	12
	MA2	4	5	0	9
	BA1	13	3	6	22
	BA2	7	3	1	11
	AA	13	9	8	30
	PS/SI	0	1	0	1
Total		50	39	25	N=114

χ^2=22.70 with 18 df, p=.203

==========

Section III

15. If you are currently working in a academic library, what is the size of the library's collection?
_____ volumes

Mean Collection Size, By Survey Medium

	Paper	Web/Email	Web/Mail	F	df	P
Collection size	372,856.4	892,068.3	572,840.2	2.668	2	.074

==========

Section III

16. Do you have your own computer at home? Yes ⌟ No ⌟

		Survey Groups			Total
		paper	email/web	mail/web	
	No	15	14	9	38
	Yes	36	26	18	80
Total		51	40	27	118

χ^2=3.41, with 2 df, p=.843

==========

Section III

18. If you have a computer at home, do you have email access of any sort at home? Yes ⌟ No ⌟

		Survey Groups			Total
		paper	email/web	mail/web	
	No	7	6	2	15
	Yes	29	20	16	65
Total		36	26	18	N=80

χ^2=1.02, with 2 df, p=.600

==========

Section III

20. Do you have Internet access at home? Yes ☐ No ☐

		Survey Groups			Total
		paper	email/web	mail/web	
	No	7	6	1	14
	Yes	29	20	17	66
Total		36	26	18	N=80

χ^2=2.43, with 2 df, p=.296

==========

Tests for Hypotheses 2 and 3

- Hypothesis 2: Respondents to the Web survey will not give responses that are significantly different from responses to the paper survey.

- Hypothesis 3: Respondents will not provide significantly different answers to the Web survey whether they were notified of it by email or postal mail.

To test these hypotheses, the content of the responses to several items in Sections I and II were compared. Ns for the ANOVA tests for these hypotheses varied between 109-118 overall (47-51 for the paper survey, 32-40 for the Web survey/notified by email, and 18-27 for the Web survey/notified by mail).

==========

Section I

2. a. If you answered yes to question 1, how long has your library had NC LIVE? _____ months

Mean Number of Months, By Survey Medium

	Paper	Web/Email	Web/Mail	F	df	P
Number of Months	11.67	11.55	11.41	.118	2	.889

==========

Section I

3. In your view, what are the greatest benefits of having NC LIVE? *Please check all that apply.*

- ❑ Helps staff learn more electronic resources
- ❑ Encouragement of patrons to explore electronic resources
- ❑ Provides a marketing tool to promote the library to the community
- ❑ Greater variety of resources for patrons
- ❑ Brings more people into the library
- ❑ Other: _____

Mean Proportion Checking Each Response Option, By Survey Medium

	Paper	Web/Email	Web/Mail	F	df	P
Staff learning	.45	.49	.44	.077	2	.926
Resource variety	.92	.95	1.00	1.109	2	.334
Patron exploration	.63	.44	.63	1.971	2	.144
Increased patronage	.29	.31	.19	.690	2	.504
Marketing tool	.37	.31	.26	.547	2	.580

==========

Section I

4. In your view, what are the greatest detriments of having NC LIVE? *Please check all that apply.*

- ❑ Additional bibliographic instruction demands on staff
- ❑ Heavy demand for computers
- ❑ Strains staff coverage at the reference desk
- ❑ Increases patron reliance on electronic resources even when print resources are more appropriate
- ❑ Other: _____

Mean Proportion Checking Each Response Option, By Survey Medium

	Paper	Web/Email	Web/Mail	F	df	P
Increased BI	.51	.46	.56	.282	2	.755
Reliance on e- resources	.69	.56	.52	1.260	2	.288
High computer demand	.36	.54	.52	1.681	2	.191
Strained staff coverage	.25	.21	.33	.679	2	.509

==========

Section I

5. How many public computer stations in the library where you work give patrons access to NC LIVE? _____

Mean Number of Computers, By Survey Medium

	Paper	Web/Email	Web/Mail	F	df	P
Number of Computers	27.40	45.97	30.52	2.454	2	.091

==========

Section I

6. Can patrons access multiple software applications on these computer stations, including software like word-processing programs? Yes ⌟ No ⌟

		Survey Groups			Total
Access multiple software		paper	email/web	mail/web	
	No	10	6	10	26
	Yes	41	33	17	91
Total		51	39	27	N=117

χ^2=4.69, 2 df, p=.096

==========

Section I

8. Assess the level of demand for the library's public computer stations before NC LIVE was available (1 is least; 5 is greatest).

1	2	3	4	5
less than 5 users per hour at peak periods				more than 20 users per hour at peak periods

Mean Demand, By Survey Medium

	Paper	Web/Email	Web/Mail	F	df	P
Demand Pre-NC LIVE	3.28	4.00	3.56	3.095	2	.049

Bonferroni

		Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
(I) Survey Group	(J) Survey Group				Lower Bound	Upper Bound
paper	email/web	.72	.29	.043	-1.43	-1.55E-02
paper	mail/web	-.28	.31	1.000	-1.04	.49
email/web	mail/web	.44	.33	.558	-.37	1.26

==========

Section I

9. Assess the level of demand for these stations now with NC LIVE (1 is least; 5 is greatest).

1	2	3	4	5
less than 5 users per hour at peak periods				more than 20 users per hour at peak periods

Mean Demand, By Survey Medium

	Paper	Web/Email	Web/Mail	F	df	P
Demand Now	4.00	4.40	4.35	1.998	2	.141

==========

Section I

10. Assess your own frequency of use of electronic indexes either on CD-ROM or via the Internet (e.g., ERIC, Psychlit, MEDLINE) per hour at the reference desk prior to gaining NC LIVE (1 is least; 5 is greatest). Do not include uses of the library's online catalog.

1	2	3	4	5
less than 2 uses per hour				more than 10 uses per hour

Mean Frequency of Use, By Survey Medium

	Paper	Web/Email	Web/Mail	F	df	P
Frequency before NC LIVE	2.66	3.00	2.56	.990	2	.375

==========

Section I

11. Assess your own frequency of use of electronic indexes through NC LIVE per hour at the reference desk (1 is least; 5 is greatest).

1	2	3	4	5
less than 2 uses per hour				more than 10 uses per hour

Mean Frequency of Use, By Survey Medium

	Paper	Web/Email	Web/Mail	F	df	P
Current frequency	3.12	3.39	3.07	.658	2	.520

==========

Section I

13. How many databases in NC LIVE do you personally use regularly? _____

Mean Number of Databases, By Survey Medium

	Paper	Web/Email	Web/Mail	F	df	P
Number of Databases Used	6.40	5.31	4.74	1.065	2	.348

==========

Section I

15. Has NC LIVE increased the amount of bibliographic instruction you provide to patrons?

		Survey Groups			Total
Access multiple software		paper	email/web	mail/web	
	No	7	9	4	20
	Yes	44	26	23	93
Total		51	35	27	N=113

χ^2=5.40, 4 df, p=.248

==========

Section I

17. How much in-class training have you had in using NC LIVE (in hours)? _____

Mean Number of Hours, By Survey Medium

	Paper	Web/Email	Web/Mail	F	df	P
Training hours	6.44	6.72	7.32	.092	2	.912

==========

Section I

18. Do you feel these workshops have provided sufficient training? Yes ⌟ No ⌟

		Survey Groups			Total
Access multiple software		paper	email/web	mail/web	
	No	8	4	6	18
	Yes	31	20	16	68
Total		39	25	22	86

χ^2=3.26, 4 df, p=.515

==========

Section II

8. Which unit below best describes the frequency with which you have referred to electronic literature databases, either on CD-ROM or via the Internet, during reference desk work in the last year?

Every hour ⌟ Every day ⌟ Every week ⌟ Every month ⌟

		Survey Groups			Total
Frequency last year		paper	email/web	mail/web	
	everyhr	0	1	0	1
	everyday	5	2	0	7
	everywk	23	14	9	46
	everymo	23	20	16	59
Total		51	37	25	N=113

χ^2=6.35, 6 df, p=.385

==========

Section II

9. Which unit below best describes the frequency with which you currently use such databases during reference desk work?

Every hour ⌟ Every day ⌟ Every week ⌟ Every month ⌟

		Survey Groups			Total
Frequency currently		paper	email/web	mail/web	
	everyhr	1			1
	everyday	5	2	1	8
	everywk	16	11	7	34
	everymo	29	24	17	70
Total		51	37	25	N=113

χ^2=6.09, 8 df, p=.637

==========

Section II
Please estimate the number of times you use each of the following electronic resources at work but **outside** of reference desk service in a typical week:

	Times Per Week				
	Never	Less than 10	11-25	26-50	More than 50
10. World Wide Web access *(e.g., research or surfing)*					

		Survey Groups			Total
Frequency of WWW use		paper	email/web	mail/web	
	never	0	0	0	0
	<10	13	5	3	21
	11-25	19	13	14	46
	26-50	12	11	5	28
	>50	6	11	5	22
Total		50	40	27	N=117

χ^2=8.13, with 6 df, p=.229

==========

Section II
Please estimate the number of times you use each of the following electronic resources at work but **outside** of reference desk service in a typical week:

	Times Per Week				
	Never	Less than 10	11-25	26-50	More than 50
11. Electronic mail					

		Survey Groups			Total
Frequency of email use		paper	email/web	mail/web	
	never	0	0	1	1
	<10	9	5	1	15
	11-25	17	15	9	41
	26-50	13	8	7	28
	>50	12	12	9	33
Total		51	40	27	N=118

χ^2=7.26 with 8 df, p=.509

==========

Section II

Please estimate the number of times you use each of the following electronic resources at work but **outside** of reference desk service in a typical week:

	Times Per Week				
	Never	Less than 10	11-25	26-50	More than 50
12. Listservs/Newsgroups					

		Survey Groups			Total
Frequency of listservs/newsgroups use		paper	email/web	mail/web	
	never	7	6	1	14
	<10	20	18	14	52
	11-25	14	7	5	26
	26-50	5	7	3	15
	>50	3	2	3	8
Total		49	40	26	N=115

χ^2=5.94 with 8 df, p=.654

==========

Section II

Plea e estimate the number of times you use each of the following electronic resources at work but **outside** of reference desk service in a typical week:

	Times Per Week				
	Never	Less than 10	11-25	26-50	More than 50
13. Searching or maintaining your library's online catalog					

		Survey Groups			Total
Frequency of online catalog use		paper	email/web	mail/web	
	never	2	0	0	2
	<10	10	6	9	25
	11-25	13	8	3	24
	26-50	12	11	9	32
	>50	14	13	6	33
Total		51	38	27	N=116

χ^2=8.21 with 8 df, p=.413

==========

Section II

Please estimate the number of times you use each of the following electronic resources at work but **outside** of reference desk service in a typical week:

	Times Per Week				
	Never	Less than 10	11-25	26-50	More than 50
14. Computing software *(e.g., word-processing or spreadsheet programs)*					

Frequency of computing software use		Survey Groups			Total
		paper	email/web	mail/web	
	never	2	1		3
	<10	17	12	8	37
	11-25	12	17	12	41
	26-50	12	6	2	20
	>50	8	4	5	17
Total		51	40	27	N=118

χ^2=8.21 with 8 df, p=.413

==========

Tests for Hypothesis 5

- Hypothesis 5: At least 50 percent of the total number of responses to the Web survey will be returned in one week.

Date Responses Were Received

Mean Date Received, By Survey Medium

	Paper	Web/Email	Web/Mail	F	df	P
Date	13.41	4.20	6.74	37.769	2	.000

Bonferroni

(I) Survey Group	(J) Survey Group	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
paper	email/web	9.21	1.10	.000	6.54	11.88
paper	mail/web	6.67	1.24	.000	3.66	9.68
email/web	mail/web	-2.54	1.30	.157	-5.69	.61

Other Comparisons

A few significant relationships appeared in comparisons of variables other than those between the different survey groups. Librarians in lower Carnegie classification institutions indicated having a greater number of training hours and a greater desire for additional training than those in research and doctoral institutions. There was a strong negative correlation between the Carnegie classification of the respondents' libraries and the number of training hours respondents received (Spearman's rho =–0.354, p= 0.000). The higher the Carnegie classification, the lower the number of training hours the respondent was likely to indicate having received. The correlation between the number of computers and the number of training hours also showed a strong negative relationship (Pearson's r=–0.258, p=0.008). (The relationship between the Carnegie classification and number of computers is, of course, a strong positive one [Spearman's rho=.715, p=0.000].)

This is logical because libraries in research institutions with greater resources often already had access to and experience with electronic databases in general prior to the inception of the NC LIVE program, including some specific databases to which NC LIVE provides access. This also explains why the number of computers in the respondents' libraries was also positively correlated with high demand for computers both before and after the inception of the NC LIVE program (Pearson's r=0.516, p=0.000), and with the likelihood the respondent would report a high level of use of electronic resources prior to the inception of NC LIVE (Pearson's r=0.289, p=0.003). The number of computers also exhibited a significant positive correlation with respondents' more frequent use of listservs and news groups (Pearson's r=0.193,

p=0.043). Although the relationships between the number of computers and more frequent use of the Web or email or other electronic resources were not significant, these relationships showed the same positive trend.

Interestingly, respondents who reported an increase in bibliographic instruction in general, and specifically those who reported an increase in time spent with individual patrons, tended to have a smaller number of computers (t=–4.164 with df=107, p=0.000, and t=–3.391 with df=104, p=0.000 respectively). This could be explained, however, by the possibility that libraries in research institutions may have done more of this type of instruction than smaller libraries prior to the introduction of NC LIVE. Consequently, they would not have experienced an increase with the inception of NC LIVE because instruction would already have been occurring frequently.

Appendix E

Survey Content Summary

Section I. NC LIVE

1. If you are currently employed in an academic library, does it have NC LIVE access? Yes - 118 No - 0

All 118 libraries reported having access to NC LIVE. No respondents answered that their library did not have NC LIVE access. There were 51 responses from the paper survey, 40 from the Web survey group notified by email, and 27 from the Web survey group notified by mail.

2. a. If you answered yes to question 1, how long has your library had NC LIVE?

_____ months

b. If you answered no to question 1, do you know when you will get access to it? _____ (month, year) ***--Please proceed to Section II, at the bottom of the next page.***

Most libraries (58.5%) had been able to access NC LIVE for one year; only five respondents reported having access for less than seven months.

Number of Months with Access	Total Number of Responses	Responses from the Paper Survey	Responses from the Web Survey/Email Notice	Responses from the Web Survey/Mail Notice
4	1	1	0	0
6	3	2	0	1
7	1	0	0	1
8	3	2	0	1
9	5	1	3	1
10	12	3	5	4
11	11	7	2	2
12	69	27	28	14
13	6	5	1	0
14	2	0	1	1
16	2	1	0	1
18	2	1	0	1
24	1	1	0	0

(N=118)

3. In your view, what are the greatest benefits of having NC LIVE? *Please check all that apply.*

Respondents most often cited the advantage of the greater variety of resources libraries could offer patrons via NC LIVE.

Benefits of NC LIVE:	# of Responses	Paper Survey	Web Survey/ Email Notice	Web Survey/ Mail Notice
Helps staff learn more electronic resources	54	23	19	12
Greater variety of resources for patrons	111	47	37	27
Encouragement of patrons to explore electronic resources	66	32	17	17
Brings more people into the library	32	15	12	5
Provides a marketing tool to promote the library to the community	38	19	12	7
Other	36	10	16	10

(N=117)

4. In your view, what are the greatest detriments of having NC LIVE? *Please check all that apply.*

The disadvantage most frequently cited was the increased reliance of patrons on electronic resources even when print resources were more appropriate. Libraries with lower Carnegie classifications were less likely to have this concern.

Disadvantages of NC LIVE:	# of Responses	Paper Survey	Web Survey/ Email Notice	Web Survey/ Mail Notice
Additional bibliographic instruction demands on staff	59	26	18	15
Increases patron reliance on electronic resources even when print resources are more appropriate	71	35	22	14
Heavy demand for computers	53	18	21	14
Strains staff coverage at the reference desk	30	13	8	9
Other	32	9	9	14

(N=117)

5. How many public computer stations in the library where you work give patrons access to NC LIVE? _____

The number of computers varied greatly. 15 respondents reported their libraries had more than 100 computers; 45 reported having less than 20. The most frequently reported numbers were 100 and 20 (8 respondents each), followed by 8 (7 respondents). Nine, fourteen and fifteen computers were reported by six respondents each. (N=113)

Number of Computers	Total Number of Responses	Paper Survey	Web Survey/Email Notice	Web Survey/Mail Notice
2	3	1	1	0
3	1	0	0	1
4	2	2	0	0
5	2	1	0	1
6	4	2	1	1
7	5	4	1	0
8	7	4	1	2
9	6	3	1	2
10	5	2	1	2
11	2	2	0	0
12	2	1	0	1
14	6	4	2	0
15	6	5	1	0
16	2	1	1	0
17	2	0	1	1
18	3	1	2	0
19	3	1	0	2
20	8	3	4	1
21	1	0	1	0
22	1	0	0	1
24	1	0	0	1
25	1	0	0	1
26	1	0	1	0
27	3	1	1	1
30	2	1	1	0
32	1	0	0	1
34	1	0	0	1
35	1	0	1	0
36	3	1	2	0
40	3	1	1	1
45	4	1	2	1
49	1	0	1	0
50	1	1	0	0

Number of Computers	Total Number of Responses	Paper Survey	Web Survey/Email Notice	Web Survey/Mail Notice
58	1	0	1	0
60	1	0	1	0
70	1	0	0	1
75	2	0	0	2
100	7	1	5	2
130	2	1	1	0
135	1	1	0	0
140	1	1	0	0
170	1	1	0	0
175	1	0	1	0
200	1	0	1	0

6. Can patrons access multiple software applications on these computer stations, including software like word-processing programs?

77.8% of respondents indicated their libraries offered patrons access to multiple software programs (N=117). Several who responded to the paper survey noted that software was available in separate computer labs in the library, in which case they were included in the "Yes" group. Some indicated such labs were available elsewhere on campus, in which case they were included in the "No" group. If web survey respondents had been able to comment, some of them might have indicated similar circumstances.

	Total Number of Responses	Paper Survey	Web Survey/ Email Notice	Web Survey/ Mail Notice
No	10	6	10	26
Yes	41	33	17	91

7. If yes, please check software applications available. ***Please check all that apply.***

The most commonly cited "Other" software was stand-alone CD-ROMs. I expect the number of libraries offering these might have been higher if this had been a separate option.

Offer:	Total Number of "Yes" Responses	Paper Survey	Web Survey/Email Notice	Web Survey/Mail Notice
Word-processing?	43	20	14	9
Spreadsheet programs?	31	16	9	6
Library OPAC?	80	33	32	15
Scanning software?	10	5	4	1
Internet browsers?	93	40	35	18
Other?	27	11	9	7

(N=114)

8. Assess the level of demand for the library's public computer stations before NC LIVE was available (1 is least; 5 is greatest).

1	2	3	4	5
less than 5 users per hour at peak periods				more than 20 users per hour at peak periods

Most libraries ranked the demand for computers prior to receiving NC LIVE quite high.

Demand Level Prior to Receiving NC LIVE Access	Total Number of Responses	Paper Survey	Web Survey/ Email Notice	Web Survey/ Mail Notice
1	8	4	1	3
2	18	10	4	4
3	26	14	7	5
4	17	7	5	5
5	40	12	18	10

(N=109)

9. Assess the level of demand for these stations now with NC LIVE (1 is least; 5 is greatest).

1	2	3	4	5
less than 5 users per hour at peak periods				more than 20 users per hour at peak periods

Few libraries indicated a change in demand from lesser to greater after receiving NC LIVE access.

Demand Level After Receiving NC LIVE Access	Total Number of Responses	Paper Survey	Web Survey/Email Notice	Web Survey/Mail Notice
1	2	0	1	1
2	4	3	1	0
3	19	12	4	3
4	27	14	6	7
5	56	18	23	15

(N=108)

10. Assess your own frequency of use of electronic indexes either on CD-ROM or via the Internet (e.g., ERIC, Psychlit, MEDLINE) per hour at the reference desk prior to gaining NC LIVE (1 is least; 5 is greatest). Do not include uses of the library's online catalog.

1	2	3	4	5
less than 2 uses per hour				more than 10 uses per hour

Frequency of Use of Electronic Databases Prior to NC LIVE Access	Total Number of Responses	Paper Survey	Web Survey/Email Notice	Web Survey/Mail Notice
1	27	12	6	9
2	19	7	6	6
3	30	21	6	3
4	22	6	10	6
5	11	4	4	3

(N=109)

11. Assess your own frequency of use of electronic indexes through NC LIVE per hour at the reference desk (1 is least; 5 is greatest).

1 **2** **3** **4** **5**
less than 2 uses per hour **more than 10 uses per hour**

Frequency of Use of Electronic Databases through NC LIVE	Total Number of Responses	Responses from the Paper Survey	Responses from the Web Survey/Email Notice	Responses from the Web Survey/Mail Notice
1	11	4	4	3
2	25	10	6	9
3	27	17	6	4
4	31	14	12	5
5	19	5	8	6

(N=113)

12. Which resources within NC LIVE do you refer patrons to most frequently?

The two databases to which respondents most frequently referred patrons were the full-text resources, ProQuest and Ebscohost, by a wide margin. ProQuest was cited eighty-one times and Ebscohost sixty-five times. OCLC FirstSearch was the next closest choice, with thirty-one occurrences. Respondents mentioned PsycInfo eighteen times and ERIC eleven times. Others that had multiple votes included Medline, with six, and InfoTrac, with two.

13. How many databases in NC LIVE do you personally use regularly?

There was a wide range in the number of databases used regularly, but the majority of respondents reported regularly using three.

Number of NC LIVE Databases Used Regularly	Total Number of Responses	Responses from the Paper Survey (Number)	Responses from the Web Survey/Email Notice (Number)	Responses from the Web Survey/Mail Notice (Number)
0	1	1	0	0
1	3	2	0	1
2	12	4	5	3
3	24	6	14	4
4	16	6	3	7
5	17	10	3	4
6	14	7	3	4
7	2	0	1	1
8	2	1	1	0
9	2	2	0	0
10	10	4	3	3
12	1	1	0	0
14	2	1	1	0
15	1	0	1	0
20	1	0	1	0
25	1	1	0	0
40	1	1	0	0

(N=110)

14. Which ones do you use most frequently? _____

Respondents did not indicate they used noticeably different databases than the ones to which they refer patrons. Again, ProQuest and Ebscohost, along with WorldCat, were the most frequently used by respondents themselves. ProQuest was cited eighty-four times, WorldCat seventy-three times, and Ebscohost forty-three times. PsycInfo received sixteen votes, and ERIC nine. Medline again received six, and InfoTrac two.

15. Has NC LIVE increased the amount of bibliographic instruction you provide to patrons?

NC LIVE increased bibliographic instruction for 75.41% of respondents. (N=113)

	Total Number of Responses	Paper Survey	Web Survey/ Email Notice	Web Survey/ Mail Notice
No	7	9	4	20
Yes	44	26	23	93

16. If yes, how? ***Please check all that apply.***

Time spent with individual patrons was cited most often. "Other" ways BI increased that were mentioned were in the amount of time spent with faculty and staff; the length of classes taught; and sessions formulated for particular classes.

Ways BI Increased	Total Number of "Yes" Responses	Paper Survey	Web Survey/Email Notice	Web Survey/Mail Notice
Time Spent with Individual Patrons	88	43	23	22
# of Group Classes Taught	45	22	9	14
Other	10	3	4	3

(N=109)

17. How much in-class training have you had in using NC LIVE (in hours)? ____

Number of in-class training hours varied widely, from a minimum of zero hours to a maximum of 40 hours (some respondents to the paper survey indicated they participated in "train-the-trainer" sessions, accounting for the higher numbers of training hours). Many respondents (24.6%) had no training specific to NC LIVE. This group corresponded strongly with higher Carnegie classifications (Pearson's r=–0.356, p=0.000). 21.4% of respondents had between 2 and 4 hours of training. 38.2% had more than 4 hours of training. The mean number of hours was 6.74, s.e.=8.24.

18. Do you feel these workshops have provided sufficient training? Yes ❑ No ❑

Most who had training felt the classes had not provided sufficient training. Most who had no training indicated they were satisfied they had enough training. These results are not too surprising when one considers that many of the larger libraries had access to many of the NC LIVE databases via independent licenses prior to the inception of the NC LIVE program.

	Total Number of Responses	Paper Survey	Web Survey/Email Notice	Web Survey/Mail Notice
No	18	8	4	6
Yes	67	31	20	16

(N=86)

Section II. Electronic Library Services/Experience

Please indicate whether the library where you work offers patrons the following kinds of access:

Respondents' libraries offer the following resources in the indicated numbers:

	Total Number of "Yes" Responses	Paper Survey	Web Survey/ Email	Web Survey/ Mail
1. **Graphics-based World Wide Web searching/browsing** (*e.g., using Netscape, Mosaic or Explorer software*)	117	51	40	26
2. **Text-based World Wide Web browsing** (*e.g., using Lynx software*)*	31	11	10	10
3. **Email accounts**	66	27	26	13
4. **Newsgroup services** (*e.g., access to newsgroup readers*) *	36	12	16	8
5. **Library's catalog online**	115	49	39	27
6. **Computing software** (*e.g., word-processing or spreadsheet programs*)	65	28	20	17
7. **Other**	31	11	8	12

(N=118)

*Since most graphics-based web browsers are also capable of text-browsing and newsgroup services can be accessed via web browsers and email, it seems likely that many respondents did not fully understand these options.

8. Which unit below best describes the frequency with which you have referred to electronic literature databases, either on CD-ROM or via the Internet, during reference desk work in the last year?

Every hour ❑ Every day ❑ Every week ❑ Every month ❑

Frequency of use of electronic databases overall in the last year was relatively low.

	Total Number of Responses	Paper Survey	Web Survey/ Email	Web Survey/ Mail
Every hour	1	0	1	0
Every day	7	5	2	0
Every week	46	23	14	9
Every month	59	23	20	16

(N=113)

9. Which unit below best describes the frequency with which you currently use such databases during reference desk work?

Every hour ❑ Every day ❑ Every week ❑ Every month ❑

Use at the current time does not show noticeable change from last year.

	Total Number of Responses	Number from Paper Survey	Number from Web Survey/ Email	Number from Web Survey/ Mail
Every hour	1	1	0	0
Every day	8	5	2	1
Every week	34	16	11	7
Every month	69	29	24	16

(N=112)

Please estimate the number of times you use each of the following electronic resources at work but outside of reference desk service in a typical week:

10. World Wide Web	Total Number of Responses	Paper Survey	Web Survey/ Email	Web Survey/ Mail
Never	0	0	0	0
Less than 10	46	19	13	14
11-25	28	12	11	5
26-50	22	6	11	5
More than 50	21	13	5	3

(N=117)

11. Email	Total Number of Responses	Paper Survey	Web Survey/ Email	Web Survey/ Mail
Never	1	0	0	1
Less than 10	15	9	5	1
11-25	41	17	15	9
26-50	28	13	8	7
More than 50	33	12	12	9

(N=118)

12. Listservs or Newsgroups	Total Number of Responses	Paper Survey	Web Survey/ Email	Web Survey/ Mail
Never	14	7	6	1
Less than 10	52	20	18	14
11-25	26	14	7	5
26-50	15	5	7	3
More than 50	8	3	2	3

(N=115)

13. Online Catalog	Total Number of Responses	Paper Survey	Web Survey/ Email	Web Survey/ Mail
Never	2	2	0	0
Less than 10	25	10	6	9
11-25	24	13	8	3
26-50	32	12	11	9
More than 50	33	14	13	6

(N=116)

14. Computing Software	Total Number of Responses	Paper Survey	Web Survey/ Email	Web Survey/ Mail
Never	3	2	1	0
Less than 10	37	17	12	8
11-25	41	12	17	12
26-50	20	12	6	2
More than 50	17	8	4	5

(N=118)

15. Other Electronic Resources*	Total Number of Responses	Paper Survey	Web Survey/ Email	Web Survey/ Mail
Never	2	1	0	1
Less than 10	2	1	1	0
11-25	4	3	0	1
26-50	2	1	0	1
More than 50	3	0	3	0

(N=13)

*Most frequently cited other resource was databases on CD ROM; others mentioned were technical reports, acquisitions database, OCLC/Interlibrary Loan, and desktop publishing applications.

Section III. Demographics

1. Age

Participants' age groups broke down as follows:

Age	Total Number of Responses	Paper Survey	Web Survey/ Email	Web Survey/ Mail
25-34 years	20	8	10	2
35-44 years	21	7	6	8
45-54 years	59	29	15	15
55-64 years	18	7	9	2

(N=118)

2. Sex

Sex of participants broke down as follows:

Sex	Total Number of Responses	Paper Survey	Web Survey/ Email	Web Survey/ Mail
male	33	13	10	10
female	84	37	30	17

(N=117)

3. Is English your first language? Yes ❑ No ❑
If no, what is your first language? _____

Only two respondents indicated that their first language was not English. Both completed the paper survey, and neither specified their first language. (N=118)

4. Please check your highest level of library education completed:

Education level of participants broke down as follows:

Education Level	Total Number of Responses	Paper Survey	Web Survey/ Email	Web Survey/ Mail
Paraprofessional	6	2	4	0
Associate's degree	2	2	0	0
Bachelor's degree	1	1	0	0
Master's degree	109	46	36	27

(N=118)

5. Please list any other non-library degrees you hold. _____

Thirty-five respondents indicated they held graduate degrees in fields other than library science. Four respondents indicated they held degrees in other fields, but did not indicate at what level (whether bachelor's or graduate). Twenty-three indicated they held bachelor's (and in one case, associate's) degrees in other fields. One person noted that they held a masters degree from a non-accredited institution. Disciplines most frequently mentioned were English and History. There were 37 responses from the paper survey, 14 from the Web survey group notified by email, and 14 from the Web survey group notified by mail. (N=65)

6. Are you currently employed more than 30 hours in a academic library?
Yes ❑ No ❑

94.02% of respondents indicated they were employed full-time in an academic library.

	Total Number of Responses	Paper Survey	Web Survey/Email Notice	Web Survey/Mail Notice
No	7	4	2	1
Yes	110	46	38	26

(N=117)

7. If so, how long have you worked in that library? Years ____ Months ____

Time employed in the current library varied from 2 months to 37 years, with an average of 10 and three-quarters years and a mode of 20 years. There were 48 responses from the paper survey, 40 from the Web survey group notified by email, and 27 from the Web survey group notified by mail. The standard deviation was 8.99. (N=115)

8. Overall, how long have you worked full-time in libraries (this one plus any other libraries where you may have been employed full-time)? Years __ Months __

Time employed in libraries overall varied from 2 months to 41 years, with an average of 16.1 years and a mode, again, of 20 years. There were 51 responses from the paper survey, 39 from the Web survey group notified by email, and 27 from the Web survey group notified by mail. The standard deviation was 9.70. (N=117)

9. What is your job title? _____

Job titles, not surprisingly, were all over the map. "Reference" and "Public Services" figured in most frequently with 35 occurrences, or 28.69%, between the two, but titles varied from A/V Librarian to Government Documents Librarian to simply Director. There were 50 responses from the paper survey, 38 from the Web survey group notified by email, and 27 from the Web survey group notified by mail. (N=115)

10. How many hours each week do you work at the reference desk?

Most people indicated working six to fifteen hours on the reference desk each week.

Hours Worked Per Week	Total Number of Responses	Paper Survey	Web Survey/ Email	Web Survey/ Mail
Less than 5 hours	13	4	8	1
6-10 hours	31	15	6	10
11-15 hours	37	15	14	8
16-20 hours	13	9	2	2
21-30 hours	10	4	3	3
More than 30 hours	13	4	6	3

(N=117)

11. Would you categorize your work as primarily public service (reference), primarily technical, or primarily managerial?

The majority of respondents indicated their primary work responsibility was public service.

Type of Work	Total Number of Responses	Paper Survey	Web Survey/ Email	Web Survey/ Mail
Public Service	74	27	28	19
Technical	20	13	6	1
Managerial	23	10	6	7

(N=117)

12. If you answered "public service" above, do you mainly provide service to students, faculty or members of the larger community?

The largest audience indicated by far was students. (N=83)

Audience	Total Number of Responses	Number from Paper Survey	Number from Web Survey/ Email	Number from Web Survey/ Mail
students	80	34	29	17
faculty	1	0	1	0
larger community	2	1	0	1

13. If you are currently working in an academic library, what is its Carnegie classification?

- ❑ Research University I
- ❑ Research University II
- ❑ Doctoral University I
- ❑ Doctoral University II
- ❑ Master's (Comprehensive) University/College I
- ❑ Master's (Comprehensive) University/College II
- ❑ Baccalaureate (Liberal Arts) College I
- ❑ Baccalaureate (Liberal Arts) College II
- ❑ Associate of Arts College
- ❑ Professional School/Specialized Institution

The Carnegie Classification of Higher Education groups American colleges and universities according to their missions. It aims to cluster institutions with similar programs and purposes. The largest number of respondents were in the Associate of Arts College classification, the category that includes most community colleges. (N=114)

Classification	Total Number of Responses	Number from Paper Survey	Number from Web Survey/ Email	Number from Web Survey/ Mail
Research University I	11	2	7	2
Research University II	1	0	1	0
Doctoral University I	8	4	2	2
Doctoral University II	9	5	2	2
Master's (Comprehensive) University/College I	12	2	6	4
Master's (Comprehensive) University/College II	9	4	5	0
Baccalaureate (Liberal Arts) College I	22	13	3	6
Baccalaureate (Liberal Arts) College II	11	7	3	1
Associate of Arts College	30	13	9	8
Professional School/Specialized Institution*	1	0	1	0

*Includes Religion and Theology; Medical; Health Professions; Engineering and Technology; Business and Management; Art, Music, and Design; Law; Teachers Colleges; Other Specialized Institutions; and Tribal Colleges and Universities.

14. If you are currently working in an academic library, is it the main campus library or a departmental library (health sciences, law, art, etc.)?

Most respondents indicated working in the main library on their campus.

	Total Number of Responses	Paper Survey	Web Survey/ Email	Web Survey/ Mail
Departmental	3	1	0	2
Main	72	48	0	24

(N=75)

15. If you are currently working in an academic library, what is the size of the library's collection? _____ volumes

Collection size varied from 70 volumes to 5 million volumes. The mean was 598,892.07. The median was 200,000. The standard deviation was 1,072,178.23. There were 49 responses from the paper survey, 40 from the Web survey group notified by email, and 26 from the Web survey group notified by mail. (N=114)

16. Do you have your own computer at home?
17. If yes, do you use it more than once a week?
18. If you have a computer at home, do you have email access of any sort at home?
19. If yes, do you use it more than once a week?
20. Do you have Internet access at home?
21. If yes, do you use it more than once a week?

	Total Number of Responses	Paper Survey	Web Survey/ Email	Web Survey/ Mail
Computer at home (N=118)	80	36	26	18
Use more than once per week (N=80)	63	28	20	15
Email access at home (N=80)	65	29	20	16
Use more than once per week (N=68)	55	24	18	13
Internet access at home (N=80)	66	29	20	17
Use more than once per week (N=69)	55	24	16	15

22. Do you have your own computer at work?

	Total Number of Responses	Number Yes from Paper Survey	Number Yes from Web Survey/Email	Number Yes from Web Survey/Mail
No	9	4	3	2
Yes	106	45	37	24

(N=115)

Questions that appeared on the Web survey only (Ns will be low):

22. **Did you complete this survey at work, at home or at another location?**

	Total Number of Responses	Number from Web Survey/Email	Number from Web Survey/Mail
At work	64	39	25
At home	3	1	2
At another location	0	0	0

(N=67)

24. How did you hear about this survey?

	Total Number of Responses	Number from Web Survey/ Email	Number from Web Survey/ Mail
Mail announcement	25	0	25
Email announcement	39	39	0
From a colleague	3	1	2
Other	0	0	0

(N=67)

Of the three that indicated they had heard about the survey from a colleague, two received the mail notice and one received the email notice (as indicated by the information programmed into Gform).